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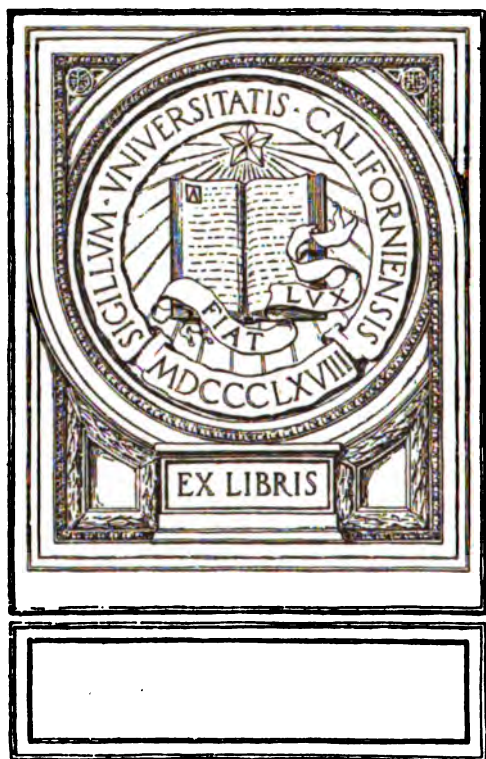
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**VALUE**  
**FOR**  
**RATE-MAKING**

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# VALUE FOR RATE-MAKING

BY

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## PREFACE

At the present time, probably the majority of valuations of public utility property are being made in connection with a consideration of rates. But different authorities still hold various and conflicting views as to the principles involved in determining the basis of value for rate-making.

With the hope of helping define methods used and standardizing practice in valuation procedure, the author brought out, four years ago, the first book that had appeared relating to the general subject, "The Valuation of Public Utility Properties." Since that time, several other books have been published, many papers written and much discussion elicited, due to the development of a rapidly increasing general interest in the subject of valuation of utility properties, for the purposes of purchase or sale, rate-making, taxation or capitalization. Despite this activity, it is a disappointment to observe that terms are still used inexactly and opinions are almost as diverse and numerous as there are writers.

The purpose of this book is an attempt to further emphasize at least three principles that seem to the author to be essential in determining the fair value for use in fixing rates.

*First.*—To conform to the rulings of the courts the basis for rate-making should be the fair present value of the property used, regardless of the amount of the original investment in utilities established previous to the present public regulation régime.

*Second.*—Present value for rate-making is obtained by making deduction for absolute depreciation only; ignoring theoretical depreciation. Absolute depreciation being that deterioration which is in evidence, existing and determined by inspection. Theoretical depreciation being estimates only, based on assumptions and computations.

*Third.*—Practically every utility property includes certain intangible non-physical elements, which should be evaluated and allowed in addition to the material, sensible elements. The value of the non-physical parts may vary from a few per cent.

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At the present public utility consideration of rate and conflicting value the basis of value

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to a hundred per cent. or more of the value of the physical parts of a property.

The author has certain definite views as to the principles to be adopted and the lines to be followed in determining values to be used as the basis of rate-making. Therefore, believing that these views will ultimately prevail in the decisions of public authorities, those which seem wrong in principle and likely to be later over-ruled by the decision of final courts, have not necessarily been referred to or included in the following pages.

It may seem presumptuous on the part of any one but an attorney to criticize, or even interpret, decisions rendered by courts or commissions, but in these matters an engineer who has been engaged for some years in making valuations, giving testimony thereon before courts and commissions, associating with attorneys in preparing cases, and assisting in writing briefs, necessarily absorbs some legal knowledge and has, perhaps, a better understanding of what is practicable in the construction and operation of utility property than a mere theorist. Finally, a knowledge of legal decisions and procedure must be fitted to facts and figures in order to prepare the proper basis upon which to fix rates.

Herein will be found much matter that was originally prepared by the author in discussing papers presented before engineering societies, in assisting the writing of legal briefs, or publication in other form, but it is hoped that as here presented, it will tend to make an orderly, logical argument for the principles involved.

HENRY FLOY.

NEW YORK CITY,  
March 1, 1916.

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# VALUE FOR RATE-MAKING

## CHAPTER I

### INTRODUCTION

**Basis for Rates.**—The determination of the value of property used in serving the public has become a very general requirement. The purpose of such determination is usually to permit the control of public utility properties through municipal, state or national regulatory bodies. Although this present commission form of regulation is a comparatively recent development, it is predicated upon the principle that private ownership may be compelled to provide adequate service at the lowest rates that will furnish a fair return upon the fair value of the property devoted to public service. It will, therefore, be recognized that the determination of property values, in connection with rate-making, is made primarily for the purpose of determining the amount of return to be allowed.

While the fixing of a fair and reasonable return may seem a complex and difficult question, nevertheless, the determination of the fair value of property is still more complicated. In this connection even so apparently a simple and elementary matter, as the making of an inventory of the physical property of a utility, requires great care, experience and expense. The work must be done in a painstaking manner, involving tedious and almost endless detail, costing relatively large amounts of money, if the results are to be free from error, and capable of substantiation in court. The opportunities for errors in making an inventory are numberless, due not alone to the grade and experience of help that must be employed, in order to keep the cost within bounds, but also to the human element which seldom attains absolute accuracy. Moreover, in many instances, lack of opportunity for close inspection, impossibility of examining unexposed property, limitations as to the time in which the work must be completed, multiplicity of items and opportunities for misunderstanding, increase the difficulties.

## 2. *FAIR VALUE FOR RATE-MAKING*

In order to fix values, even though the inventory is complete, there still remain questions involved in its proper pricing. Some of the difficulties of fixing upon fair and proper costs are due to differences in costs of the same item at different times in different localities, or under different conditions of installation; also as to whether the original cost, to-day's quoted prices, or prices based on the average over a number of years, or the present trend, shall be used; also to the fact that differences in price are made to different parties for the same item, delivered at the same place, at the same time. In addition to these difficulties, percentages must be adopted to cover some allowances that have to be made for items too small to list in the inventory, for contingencies, omissions, engineering, interest and taxes during construction, and other like items. Furthermore, the complicated cost of developing the business, which is generally recognized as proper to include as a part of the value of a going utility, must be computed or otherwise arrived at, and finally questions as to the amount to be deducted for depreciation, about which the widest differences of opinion prevail, must be estimated. In order to comply with the rulings of the court, consideration must be given original investment, the amount of outstanding stock, bonds or other securities, as well as the revenue and operating expenses, before fair value can eventually be legally determined.

The primary cause of the existing, widespread agitation, which may almost be called a mania, for the valuation of public utility property arises from a determination to secure a readjustment of charges for or quality in the service, being rendered. This determination, while frequently the expression of a proper and reasonable demand on the part of the public, is in too many instances merely the agitation of political office seekers or misinformed philanthropists aroused by unintentional errors or deliberate wrongdoing of utility managements. Frequently, changes are demanded through ignorance of what may be fairly and practically required of utility corporations. A greater readiness on the part of utility managements to impart information as to their business and a greater willingness on the part of the public to study conditions and learn facts and possibilities, would result in the avoidance of many bitter controversies between the public and the utilities. Unnecessarily large expenditures of effort and money are made by public authorities and required of corporations in valuations made necessary by rate controversies



originated by individuals, posing as protectors of the general public, although the latter may be well satisfied with existing conditions.<sup>1</sup> There can be no question but that many valuations of physical property are to-day being made which cannot be of much practical use, because not made at the time rates are to be determined, or a sale effected. Moreover, in some cases, where fair valuations of utilities could properly be used for adjusting rates or fixing values for sale, improper valuations are being unfairly and illegitimately used. This is brought about by the financial inability or fear of a greater evil than too low a valuation, on the part of the corporations. They, therefore, refrain from attacking such improper valuations, which, being allowed to stand, thereby become legalized through commission or even court decisions. A frequent instance of the error to be found in the rulings of public authorities results from their failure to add to the physical values the other and equally important non-physical values, the sum of which two elements makes up the total value of an operating utility.

An excellent statement of the basis of value for rate-making was made by President Wilson when he ran for Governor of New Jersey in 1911. A voter of the State propounded this question to him in an open letter:

"Do you believe that all the public utilities of New Jersey ought to be valued with regard to their physical property alone, and on the value thus found rates should be fixed, which should allow them 6 per cent. on that value?"

President Wilson's reply was:

"No, I believe the physical value has an important bearing upon the question, but I also think that all the physical, financial and economic circumstances should be considered in connection therewith."<sup>2</sup>

In fixing rates, valuation of the property is by no means the only requirement. The determination of a fair and reasonable rate necessitates, in addition to the valuation of the property,

<sup>1</sup> The single complaint of Mayor Fuhrman of Buffalo as to the service and rates of the Cataract Power & Conduit Company of Buffalo compelled the corporation to spend thousands of dollars in presenting its case before the Public Service Commission, with the resulting illegal decision reducing rates 28 per cent., although the evidence showed that not a single customer of the corporation complained of the excellent service or of the extraordinarily low tariffs (the average price received per kw.-hr. sold was \$0.00711) but on the contrary, unanimously commended the corporation.

<sup>2</sup> Mr. T. N. McCarter in an address before the West Side Y. M. C. A. of New York City, Apr. 13, 1914.



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and rates, the progressive spirit of the decision makes clear the fact that as conditions change—whatever they may have been—public interest begets the public's power of control. The class of corporations in which the public has a regulating interest is indicated by the following extract from the insurance rate decision above referred to:

"The list of rate-regulated corporations is not too long to be here given. It includes canals, waterways and booms; bridges and ferries; wharves, docks, elevators and stockyards; telegraph, telephone, electric, gas and oil lines; turnpikes, railroads and the various forms of common carriers, including express and cabs. To these should be added the case of the innkeeper (as to which no American case has been found where the constitutional question as to the right to fix his rate has been considered), the confessedly close case of the irrigation ditches for distributing water (193 U. S. 379), and the toll mills acts. This, of course, does not include the case of condemnation for governmental purposes or for roads and ways where no question of rates is involved. There may be other instances not found, but it is believed that the foregoing enumeration exhausts the list of what has heretofore been treated as a public business, justifying exercise of the price fixing power against persons or corporations.

"It is to be noted that in each instance the power to regulate rates is exercised against a business which in every case used tangible property devoted to a public use. Some of them had a monopoly (*Spring Water Co. vs. Schlotter*, 110 U. S. 354). Some of them had franchises. Most of them used public ways or employed property which they acquired by virtue of the power of eminent domain. They were therefore subject to the correlative obligations to have the use, of what had been taken by law, fixed by law. And as further pointing out the characteristics of the public use justifying the fixing of prices, it will be noted that, with the exception of toll mills (which, however, do not employ property devoted to a public use), they all have direct relations to the business of the facilities of transportation or distribution—to transportation by carriers of passengers, goods or intelligence by vehicle or wire—to distribution of water, gas or electricity through ditch, pipe or wire; to wharfage, storage, or accommodation of property before the journey begins, when it ends, or along the way.

"When thus enumerated, they appear to be grouped around the common carrier as the typical business and all employing in some way property devoted to a public use.

"It will be seen, too, that the size of the business is unimportant, for the fares of a cabman, employing a broken-down horse and a dilapidated vehicle can be fixed by law as well as the rates of a railroad with millions

of capital and thousands of cars transporting persons and property across the continent."<sup>1</sup>

The earliest appraisals or valuations of corporation property were made in connection with the purchase and sale of water-works. Later, the excessive profits made or asserted to be made from various utility properties resulted in demands for reductions in the tariffs being charged for the service rendered; consequently valuations were required for the purpose of ascertaining whether or not the tariffs charged produced unreasonably large returns upon the values of the respective properties. This right of the public to regulate tariffs was upheld by the courts on the ground that

"property does become clothed with a public interest when used in a manner to make it of public consequence and effect the community at large."<sup>2</sup>

**Development of Law.**—The appraising of corporation property, for the purpose of establishing the fair value of such property, to be used in establishing the just basis of financial transactions between the public and the corporations has been a gradual development and hence, naturally the more elemental principles were first recognized and established. But even to-day, although the principle of establishing the fair value of corporation property is practically universally recognized and acknowledged as a necessary preliminary step for determining the tariff to be charged for a given service, nevertheless, the basis of such valuation and the various elements entering therein are not by any means agreed upon, appreciated or all allowed for in most cases where regulating authorities have been and are establishing values for rate-making.

The earlier uses of valuations were made in connection with the most simple form of corporation property where the physical property represented all or nearly all of the value of the investment. Under these conditions, the restriction of the meaning of valuation to the value of the physical property was not only natural, but in many cases fair, and yet, even in the earliest decisions of the courts, there was recognized the fact that in addition to the physical property upon which the owners were

<sup>1</sup> *German Alliance Insurance Co. vs. Ike Lewis*, Superintendent of Insurance, of the State of Kansas. Decided Apr. 20, 1914.

<sup>2</sup> *Munn vs. Illinois*, 94 U. S. 113.

entitled to a return, there might also be included in the tariff a proper charge for the value of the service rendered, provided such charge was reasonable.

One of the simplest and earlier cases determining the principles of valuation of corporation property for use in service to the public that was passed upon by the Supreme Court was in the case of a turnpike road company, which had constructed and was maintaining a turnpike extending from Covington to Lexington, Kentucky. After constructing and operating the turnpike for a number of years, the public felt that the charges by the corporation were excessive in view of the increasing traffic, and the Legislature passed an Act to compel the corporation to reduce its tariffs. In this case, while the elements of organization were most simple, the annual expenses—primarily those of maintenance—and the value of the corporation property were practically all evidenced by physical property, thus indicating the most elementary form of value, nevertheless, the Court recognized that the value of the service should be considered.

"So that the right of the public to use the defendant's turnpike upon payment of such tolls as in view of the nature and value of the service rendered by the company are reasonable, is an element in the general inquiry whether the rates established by law are unjust or unreasonable. That inquiry also involves other considerations, such, for instance, as the reasonable cost of maintaining the road in good condition for public use, and the amount that may have been really and necessarily invested in the enterprise. In short, each case must depend upon its special facts. \* \* \* \* \*"<sup>1</sup>

Formerly, the courts held that where property was used for the service of the public, the regulation of rates to be charged therefor lay entirely in the discretion of the proper legislative body and regulation in these matters was beyond the power of the courts.

"It is insisted, however, that the owner of property is entitled to a reasonable compensation for its use, even though it be clothed with a public interest, and that what is reasonable is a judicial and not a legislative question.

As has already been shown, the practice has been otherwise."<sup>2</sup>

Later, however, the decisions of the courts establishing this principle were revised, because it was recognized that the fixing

<sup>1</sup> *Covington & Lexington Turnpike Road Company vs. Sanford*, 164 U. S. 597.

<sup>2</sup> *Munn vs. Illinois* 94, U. S. 133.

of an unfairly low rate would result in unfairly depreciating the value of the property used in rendering the service, contrary to the Fourteenth Amendment.

In the case of the Chicago, Milwaukee & St. Paul Railroad Company,<sup>1</sup> it was definitely argued that

“insofar as it (the company) is definitely deprived of the lawful use of its property, while other persons are permitted to receive reasonable profits upon their invested capital, the company is deprived of the equal protection of the laws,”

that is, if the company was deprived of its right to charge reasonable rates for the use of its property, it was deprived of the lawful use of that property and consequently in substance and effect of the property itself. The Supreme Court, therefore, reversed its previous decisions contrary to this contention and in several other and later cases reaffirmed this new position, where it spoke as follows:

“These cases all support the proposition that while it is not the province of the courts to enter upon the merely administrative duty of framing a tariff of rates for carriage, it is within the scope of judicial power and a part of the judicial duty to restrain anything which, in the form of a regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property. There is nothing new or strange in this. It has always been a part of the judicial function to determine whether the act of one party (whether that party be a single individual, an organized body, or the public as a whole) operates to divest the other party of any rights of person or property. In every constitution is the guarantee against the taking of private property for public purposes without just compensation. The equal protection of the laws which, by the Fourteenth Amendment, no State can deny to the individual, forbids legislation, in whatever form it may be enacted, by which the property of one individual is, without compensation, wrested from him for the benefit of another, or of the public.”<sup>2</sup>

“That there is a remedy in the courts for relief against legislation establishing a tariff of rates which is so unreasonable as to practically destroy the value of property of companies engaged in the carrying business, and that especially may the courts of the United States treat such a question as a judicial one, and hold such acts of legislation to be in conflict with the Constitution of the United States, as depriving the

<sup>1</sup> Chicago, Milwaukee & St. Paul R. R. Co., vs. Minnesota, 134 U. S. 418.

<sup>2</sup> Reagan vs. Farmers' Loan & Trust Co., 154 U. S. 399.

companies of their property without due process of law, and as depriving them of the equal protection of the laws."<sup>1</sup>

The Federal and Circuit Courts, following the Supreme Court's decisions in these matters, have upheld the theory that a rate too low to permit a fair return on the value of the property being used for the service of the public is confiscation of that property.

"A State enactment, or regulations made under the authority of a State enactment, establishing rates for the transportation of persons or property by railroad that will not admit of the carrier earning such compensation as under all the circumstances is just to it and the public, would deprive such carrier of its property without due process of law and deny to it the equal protection of the laws, and would therefore be repugnant to the Fourteenth Amendment of the Constitution of the United States."<sup>2</sup>

"As the right to use property for any lawful purpose to the extent of the realization therefrom of a return or reward, commensurate with the reasonable and just value of such use, is an element of property, property itself pro tanto, since, without the right of such use, it would be wholly or partially valueless according to the extent of the restraint upon its use, deprivation of the use thereof, or denial of the power to each such reasonable and just return or reward, by the use thereof, in whole or in part, without compensation therefor, amounts to such wrongful taking thereof, and, therefore, to confiscation within the meaning of the decisions in cases of this kind. To constitute such confiscation, the taking need not extend to the corpus of the property nor total deprivation of reward for the use thereof. If the law renders it impossible to obtain from the use of the property a reasonable and fair return, it is confiscatory in its operation and effect, though valid on its face. The extent of such deprivation is not the test. Whether a statute is thus confiscatory does not depend upon the amount it takes, in violation of the Constitution or the extent to which it interferes with the right of use of property, guaranteed by the organic law. It is void if it so takes any at all or so interferes to any extent whatever. It is condemned not by the extent of the pecuniary injury wrought, but by its transgression of constitutional limits, its invasion of a constitutional right, as sacred to corporations as to the humblest citizen of the land, and justly so, for the reason, among others, that the property of corporations is in fact the property of citizens, and the laws cannot, and ought not, in its ultimate results, to favor one citizen or class of citizens over another."<sup>3</sup>

"The use and profits of property are themselves property, and are

<sup>1</sup> *St. Louis & San Francisco Railway vs. Gill*, 156 U. S. 649.

<sup>2</sup> *Smyth vs. Ames*, 169 U. S. 526.

<sup>3</sup> *Coal & Coke Ry. Co., vs. Conley*, 57 S. E. (W. Va.) 639.



alike under the protection of the Federal Constitution. . . . The value of property is the value of its uses."<sup>1</sup>

"The value of property and of investment in every form is measured by the value of its use, not by its use divorced from the value thereof."<sup>2</sup>

"But the value of property results from the use to which it is put and varies with the profitableness of that use, present and prospective, actual and anticipated. There is no pecuniary value outside of that which results from such use."<sup>3</sup>

The title to ownership of property of a public utility is as complete as that of any individual for the courts have held:

"The property (of the Gas Company) now under consideration is as much the private property of this complainant as are the belongings of any private citizen."<sup>4</sup>

The difference between the rights of an individual and a public utility to use and enjoy their respective properties is that the former is not limited as to the amount of return allowed, because that is not a matter of public interest, but the latter, being a corporation in whose operations the public is interested, therefore may properly be restricted in its earnings to a reasonable return upon the value of the property used in rendering service.

"It is no longer open to dispute that under the Constitution 'what the company is entitled to demand, in order that it may have just compensation, is a fair return upon the reasonable value of the property at the time it is being used for the public.'"<sup>5</sup>

"What the company is entitled to demand, in order that it may have just compensation, is a fair return upon the reasonable value of the property at the time it is being used for the public."<sup>6</sup>

**Federal Valuation.**—One of the most important public questions at present is the proper charges for transportation to be made by utility corporations. This subject has rapidly developed during the last few years and reached its culmination in an amendment passed by Congress early in 1913, providing for a valuation by the Federal Government of the several classes of property of all common carriers; namely, steam and electric rail-

<sup>1</sup> Spring Valley Water Works vs. City, etc., of San Francisco, 192 Fed. 144, 158.

<sup>2</sup> Shepard vs. Northern Pacific Ry. Co., 184 Fed. 765, 811.

<sup>3</sup> Cleveland, Cincinnati, Chicago & St. Louis Ry. Co. vs. Backus, 154 U. S. 439, at p. 445.

<sup>4</sup> Consolidated Gas Co. vs. New York, 157 Fed. 854.

<sup>5</sup> San Diego Land & Town Co. vs. Jasper, 189 U. S. 442.

<sup>6</sup> San Diego Land & Town Co. vs. National City, 174 U. S. 739.

roads, navigation companies, express companies, telephone companies, etc., doing an interstate business. This amendment is so far-reaching and is destined to become so important that it is herewith reproduced at length.

An Act To amend an Act entitled "An Act to regulate commerce," approved February fourth, eighteen hundred and eighty-seven, and all Acts amendatory thereof by providing for a valuation of the several classes of property of carriers subject thereto and securing information concerning their stocks, bonds, and other securities.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Act entitled "An Act to regulate commerce," approved February fourth, eighteen hundred and eighty-seven, as amended, be further amended by adding thereto a new section, to be known as section nineteen a, and to read as follows:

"Sec. 19a. That the commission shall, as hereinafter provided, investigate, ascertain, and report the value of all the property owned or used by every common carrier subject to the provisions of this Act. To enable the commission to make such investigation and report, it is authorized to employ such experts and other assistants as may be necessary. The commission may appoint examiners who shall have power to administer oaths, examine witnesses, and take testimony. The commission shall make an inventory which shall list the property of every common carrier subject to the provisions of this Act in detail, and show the value thereof as hereinafter provided, and shall classify the physical property, as nearly as practicable, in conformity with the classification of expenditures for road and equipment, as prescribed by the Interstate Commerce Commission.

"First. In such investigation said commission shall ascertain and report in detail as to each piece of property owned or used by said common carrier for its purposes as a common carrier, the original cost to date, the cost of reproduction new, the cost of reproduction less depreciation, and an analysis of the methods by which these several costs are obtained, and the reason for their differences, if any. The commission shall in like manner ascertain and report separately other values, and elements of value, if any, of the property of such common carrier, and an analysis of the methods of valuation employed, and of the reasons for any differences between any such value, and each of the foregoing cost values.

"Second. Such investigation and report shall state in detail and separately from improvements the original cost of all lands, rights-of-way, and terminals owned or used for the purposes of a common carrier, and ascertained as of the time of dedication to public use, and the present value of the same, and separately the original and present cost

of condemnation and damages or of purchase in excess of such original cost or present value.

"Third. Such investigation and report shall show separately the property held for purposes other than those of a common carrier, and the original cost and present value of the same, together with an analysis of the methods of valuation employed.

"Fourth. In ascertaining the original cost to date of the property of such common carrier the commission, in addition to such other elements as it may deem necessary, shall investigate and report upon the history and organization of the present and of any previous corporation operating such property; upon any increases or decreases of stocks, bonds, or other securities, in any reorganization; upon moneys received by any such corporation by reason of any issues of stocks, bonds, or other securities; upon the syndicating, banking, and other financial arrangements under which such issues were made and the expense thereof; and upon the net and gross earnings of such corporations; and shall also ascertain and report in such details as may be determined by the commission upon the expenditure of all moneys and the purposes for which the same were expended.

"Fifth. The commission shall ascertain and report the amount and value of any aid, gift, grant of right-of-way, or donation, made to any such common carrier, or to any previous corporation operating such property, by the Government of the United States or by any State, county, or municipal government, or by individuals, associations, or corporations; and it shall also ascertain and report the grants of land to any such common carrier, or any previous corporation operating such property, by the Government of the United States, or by any State, county, or municipal government, and the amount of money derived from the sale of any portion of such grants and the value of the unsold portion thereof at the time acquired and at the present time, also, the amount and value of any concession and allowance made by such common carrier to the Government of the United States, or to any State, county, or municipal government in consideration of such aid, gift, grant, or donation.

"Except as herein otherwise provided, the commission shall have power to prescribe the method of procedure to be followed in the conduct of the investigation, the form in which the results of the valuation shall be submitted, and the classification of the elements that constitute the ascertained value, and such investigation shall show the value of the property of every common carrier as a whole and separately the value of its property in each of the several States and Territories and the District of Columbia, classified and in detail as herein required.

"Such investigation shall be commenced within sixty days after the approval of this Act and shall be prosecuted with diligence and

thoroughness, and the result thereof reported to Congress at the beginning of each regular session thereafter until completed.

"Every common carrier subject to the provisions of this Act shall furnish to the commission or its agents from time to time and as the commission may require maps, profiles, contracts, reports of engineers, and any other documents, records, and papers, or copies of any or all of the same, in aid of such investigation and determination of the value of the property of said common carrier, and shall grant to all agents of the commission free access to its right-of-way, its property, and its accounts, records, and memoranda whenever and wherever requested by any such duly authorized agent, and every common carrier is hereby directed and required to cooperate with and aid the commission in the work of the valuation of its property in such further particulars and to such extent as the commission may require and direct, and all rules and regulations made by the commission for the purpose of administering the provisions of this section and section twenty of this Act shall have the full force and effect of law. Unless otherwise ordered by the commission, with the reasons therefor, the records and data of the commission shall be open to the inspection and examination of the public.

"Upon the completion of the valuation herein provided for the commission shall thereafter in like manner keep itself informed of all extensions and improvements or other changes in the condition and value of the property of all common carriers, and shall ascertain the value thereof, and shall from time to time, revise and correct its valuations, showing such revision and correction classified and as a whole and separately in each of the several States and Territories and the District of Columbia, which valuations, both original and corrected, shall be tentative valuations and shall be reported to Congress at the beginning of each regular session.

"To enable the commission to make such changes and corrections in its valuations of each class of property, every common carrier subject to the provisions of this Act shall make such reports and furnish such information as the commission may require.

"Whenever the commission shall have completed the tentative valuation of the property of any common carrier, as herein directed, and before such valuation shall become final, the commission shall give notice by registered letter to the said carrier, the Attorney General of the United States, the governor of any State in which the property so valued is located, and to such additional parties as the commission may prescribe, stating the valuation placed upon the several classes of property of said carrier, and shall allow thirty days in which to file a protest of the same with the commission. If no protest is filed within thirty days, said valuation shall become final as of the date thereof.

"If notice of protest is filed the commission shall fix a time for hear-

ing the same, and shall proceed as promptly as may be to hear and consider any matter relative and material thereto which may be presented in support of any such protest so filed as aforesaid. If after hearing any protest of such tentative valuation under the provisions of this Act the commission shall be of the opinion that its valuation should not become final, it shall make such changes as may be necessary, and shall issue an order making such corrected tentative valuation final as of the date thereof. All final valuations by the commission and the classification thereof shall be published and shall be prima facie evidence of the value of the property in all proceedings under the Act to regulate commerce as of the date of the fixing thereof, and in all judicial proceedings for the enforcement of the Act approved February fourth, eighteen hundred and eighty-seven, commonly known as "the Act to regulate commerce," and the various Acts amendatory thereof, and in all judicial proceedings brought to enjoin, set aside, annul, or suspend, in whole or in part, any order of the Interstate Commerce Commission.

"If upon the trial of any action involving a final value fixed by the commission, evidence shall be introduced regarding such value which is found by the court to be different from that offered upon the hearing before the commission, or additional thereto and substantially affecting said value, the court, before proceeding to render judgment shall transmit a copy of such evidence to the commission, and shall stay further proceedings in said action for such time as the court shall determine from the date of such transmission. Upon the receipt of such evidence the commission shall consider the same and may fix a final value different from the one fixed in the first instance, and may alter, modify, amend or rescind any order which it has made involving said final value, and shall report its action thereon to said court within the time fixed by the court. If the commission shall alter, modify, or amend its order, such altered, modified, or amended order shall take the place of the original order complained of and judgment shall be rendered thereon as though made by the commission in the first instance. If the original order shall not be rescinded or changed by the commission, judgment shall be rendered upon such original order.

"The provisions of this section shall apply to receivers of carriers and operating trustees. In case of failure or refusal on the part of any carrier, receiver, or trustee to comply with all the requirements of this section and in the manner prescribed by the commission such carrier, receiver, or trustee shall forfeit to the United States the sum of five hundred dollars for each such offense and for each and every day of the continuance of such offense, such forfeitures to be recoverable in the same manner as other forfeitures provided for in section sixteen of the Act to regulate commerce.

"That the district courts of the United States shall have jurisdiction, upon the application of the Attorney General of the United States at the request of the commission, alleging a failure to comply with or a violation of any of the provisions of this section by any common carrier, to issue a writ or writs of mandamus commanding such common carrier to comply with the provisions of this section."

"Approved, March 1, 1913."

The first work of appraisal being undertaken by the Interstate Commerce Commission is that of all of the steam railroads of the United States. The importance of this appraisal may be judged from the fact that it is estimated the cost to the Government will be over \$20,000,000 and to the railroads \$40,000,000 or \$50,000,000 additional. The mileage of the railroads involved, in accordance with the Interstate Commerce Commission's report for the year ending June 30, 1914, is 377,102 miles of track. There are 1,695,000 employees, whose wages and salaries for the year mentioned aggregated \$1,373,422,000, as well as innumerable bond and stockholders owning \$8,680,000,000 in stock, and \$11,567,000,000 of bonds or other funded debt, who will be more or less directly affected by the results of this appraisal.

The valuation of the property of interstate carriers being undertaken by the Interstate Commerce Commission calls for the ascertaining of the cost of reproducing new the property, the cost of reproduction less depreciation, the actual original cost of construction, the amount of stock and bonds outstanding, and the amount of money invested in the property with the source thereof.

The valuation work of the Interstate Commerce Commission is often referred to as a "physical valuation" and it is assumed that the cost of reproduction of the physical property, with or without depreciation, will be taken as fixing the value of the property of the common carriers, but this is by no means the fact. The United States Supreme Court has repeatedly held that the cost of reproduction new less depreciation, if such exists, while a very important element, is only one factor entering into the final question of value.

Relatively, it is not a difficult thing to determine the rate of return, but it is a much more complicated and intricate matter to arrive at the value upon which that rate is to be computed. Until the valuation is known, it is impossible to determine what

income the property is entitled to earn, or to fix the just tariffs to be paid by the public. It is a much more difficult problem to establish the rates of return for utilities that compete with one another, as for example the steam railroads, than for other kinds of public utilities that are monopolies, such as water-works or electric light properties. Competitive conditions due to two or more railroads, or between railroads and water transportation operating between the same points, must largely control the rates that may be charged by the railroads. The rates of one railroad are of necessity bound up with and interdependent upon those of its competitor. The attempt to fix rates for one railroad upon the basis of a fair return upon its fair value, as might be done in the case of a water-works or gas plant, might result in the same rates being most advantageous or detrimental to the competing railroad, depending upon whether the investment made in the latter was larger or less than that of the road whose property had been used in fixing rates. Thus, it will be seen that the problem of establishing individual railway rates or tariffs for particular classes of merchandise transported will not be solved by "physical valuation" or probably not alone by any valuation whatever, but the problems will be enormously simplified, and the knowledge from a reliable source as to the value of the various railroad properties, the character of the investments, the state of efficiency, etc., will confer a great benefit upon the investing public.

The Valuation Act has been criticised as undertaking more than can be humanly accomplished sufficiently promptly to make the results practically useful. While there may be some justification for such criticism, nevertheless, great and undoubted value will attach to the work already started by the Interstate Commerce Commission, and now well under way, in that the work will give some accurate data on the question as to whether the individual railroads, as well as railroads generally, are enormously over-capitalized as claimed by many, or whether—as a class—the railroads may not have improved their property out of earnings, so that their present fair value closely corresponds to or even exceeds their capitalization. It is recognized by the Interstate Commerce Commissioners themselves that all information called for in the Act cannot be obtained; for example, the actual, original costs of many of the railroads are not now ascertainable for the

reason that early records are missing and the knowledge as to these original costs nowhere exists.

"Experience indicates that it will be possible to obtain with reasonable certainty those facts called for with respect to the corporate and financial history of the carrier, but that it will not be possible in all instances to give the original cost 'in detail as to each piece of property' as called for by the act."<sup>1</sup>

Although definite in many particulars, the amendment fails to define many of the terms it uses, such as the "cost of reproduction new," "depreciation" and "present value," apparently leaving it to the Interstate Commerce Commission to make its own interpretation of these matters, which will result in values that may be very much higher, or very much lower, than would result if the interpretation of these same terms were made, respectively, by the utility owners on the one hand or the socialists on the other hand. From the statement that the final valuations as found by the Commission shall be "prima facie evidence of the value of the property in all proceedings under the Act to regulate commerce," the primary purpose of the legislative amendment is quite commonly believed to be the finding of a basis upon which rates may be determined, but such is not stated to be the only purpose of the valuation.

**Other Bases.**—Although appraisals of property are more and more being held as a necessary fact to be considered in arriving at the fair value on which to base rates, many decisions are being made without such facts being available. A recent decision of the Public Service Commission of New York, First District, says:

"But as a matter of fact, hundreds of rate cases have been disposed of without appraisals. In some instances rates have been lowered, and in others the companies have been allowed to raise rates. While an inventory and appraisal may be of assistance in determining with great precision the exact rate for each class of consumers, they are not absolutely necessary.

The practice of the Interstate Commerce Commission, throughout its entire history, has been to reduce rates, allow increases or dismiss complaints without resorting to appraisals. In the very important Eastern and Western Rate Advance cases, in the recent proceedings before the Commission, and in the application for advances now pending,

<sup>1</sup> Twenty-ninth Annual Report of the Interstate Commerce Commission, Dec. 1, 1915, Part I, page 65.



no appraisals have been made, and the railroads have not contended that action should be deferred until the physical valuation of their properties has been completed."

"Whether the record in this case is sufficient to warrant a reduction in rates can only be determined by an examination of the evidence, but there is nothing in the law or in equity that would justify this Commission in taking the stand that it will not alter a single rate of the New York Edison Company until an appraisal has been made."

The Public Service Commission in Massachusetts has fairly constantly fixed rates without having before it appraisals of the properties considered. It rendered a recent decision as to the Middlesex and Boston Railway Company granting an increase in rates of fare from 5 to 6 cts. The decision of Oct. 28, 1914, says that while the Massachusetts statute requires the Commission to give "due regard among other things to a reasonable return upon the value of carrier's property," the Commission in passing upon the claims of the corporation that "reproduction cost of the property now being used, less depreciation by wear and tear and obsolescence," should be used as the basis of value, stated "this theory is as inexpedient as it is unjust," falling back upon the amount of the investment as the proper basis upon which to fix rates.

Although the Interstate Commerce Commission may be able to formulate principles and methods properly applicable in determining the value of the property of common carriers, it by no means follows, as recognized by Commissioner Prouty, that such values are the only considerations to be used in fixing rates. The determination of proper rates for railway transportation is such an intricate and extensive matter, the principles of which cannot yet be said to be thoroughly established, that it must be generally conceded the value of the property alone cannot be used for rate-making. In determining any rate, not only the value of the plant and the worth of the service must be considered, but also the further fact that the rate must be low enough to secure the business. Furthermore, any rate based on the value of the investment, without consideration of efficiency and enterprise, is deficient in recognition of and reward to the element which above all else has made America what it is to-day.

Moreover, in fixing rates a somewhat more liberal treatment should be accorded rapidly developing public utilities, such as

those engaged in rendering electric service, compared with older and more stable utilities, such as water and perhaps gas or seasoned steam railroad systems. As a rule these latter have passed through their formative periods and now present fewer problems, in connection with rate-fixing, than those which by reason of the inability to store their product and because of their recent rapid growth and necessity for frequent discarding of plant and apparatus, have created new and less stable economic business problems.

While existing net earnings cannot be taken as fixing the value of any public utility property, the value of that property will ultimately be determined by the net earnings allowed in any rate case. After the various cost elements are obtained, such as the investment cost, the cost of reproduction, the cost of reproduction less depreciation, and a tentative value found therefrom upon which a tentative rate may be fixed, the real value of the property will result from the actual net earnings. The effect of the net earnings allowed must be considered and their result weighed as a factor in ascertaining the fair value to be allowed. The value to be established is the result of a consideration of the valuation of the property itself and the rate allowed thereon. The fixing of a value is of itself of no avail unless the return thereon is sufficient to satisfy the requirements of investors in such enterprises and to invite free capital to invest; too low a return will depreciate a value however established. A normal or liberal return will stabilize value and invite investment. It is useless to argue that either cost or investment is market value, as such latter value is only determined by the net earnings actually or prospectively obtained, regardless of what may be determined as the fair value after an appraisal or estimated as profits by a regulating body. Regardless of the methods used in ascertaining the so-called value of physical property, with or without its intangible values, the ultimate, real value will be determined by the net earnings from the property and the cost of money in open market.

## CHAPTER II

### DEFINITIONS

**Explanatory.**—Because of the present confused use of words and phrases in connection with rate-making and valuation, some brief definition of the terms used by the author is necessary.

In too many instances the English language uses the same word for different meanings. In valuation work the call for words to define new meanings, or confused and indefinite ideas as to what is intended, has resulted in the use of the same word to mean different things.

**Value.**—Academically the word “value” relates to “barter and exchange.” One of the principal causes of demand—there are several—is usefulness or utility; consequently “value” may properly be used to measure utility. In valuation work, as a rule, loss of utility results in loss of value; maximum utility determines maximum value. The ratio of existing to possible utility, measures by the same ratio, when applied to cost as used in its largest sense, the existing value, in dollars, of the commodity or service. If the term related exclusively to barter and sale, only second-hand or scrap values would be considered, which is not the basis on which any appraisal has been or is being made for determining fair values of the “used and useful” property belonging to an operating organization.

**Physical or Structural Value.**—As the term indicates, physical value relates to material things or substances, the property which can be “seen and felt.” It includes, primarily, “those things which are visible and tangible, capable of being inventoried,” but secondarily, certain non-physical charges “which are an inseparable part of the cost of construction but which do not appear in the inventory of the completed property.”

These secondary costs, which are usually included as a part of the physical property, either directly in the unit prices or added afterward in the form of percentages, are expenditures for such items as:

1. Engineers' and architects' fees, including cost of design and testing all construction and equipment, etc.

2. Administration expenses chargeable to construction, including superintendence, inspection, accounting, salaries of officers and clerks, consents of authorities and property owners for temporary work or use, legal expenses, rent, printing, store-room expenses, etc.

3. Provision for various incidentals and contingencies, incomplete inventories, unforeseen requirements, etc., which practical experience has shown to be necessary.

**Scrap or Salvage Value.**—All physical property has a certain scrap or junk value, a “barter and sale” minimum basis beyond which there is no depreciation, hence physical property can only deteriorate until it reaches its scrap value. If a property consisting of its several elements is usable not as junk but as serviceable property elsewhere, a higher price than scrap value is obtainable, and this worth has been characterized as “salvage value.”

**Wearing Value.**—If from the cost—taken on whatever basis is determined to be the correct one—there is subtracted “scrap” or “salvage” value of given physical property, the remainder is a value known as “wearing value” (sometimes improperly called service value).

**Service Value.**—Physical property, honestly and intelligently purchased with a view to its suitability for the service intended, aside from some hidden defect or untoward accident, generally maintains its original utility, and hence its value, for the purpose of use, practically throughout its life, except for such deterioration as results from wear and tear or deferred maintenance. The life of the property may expire normally through age or prematurely through accident, inadequacy or obsolescence, but these latter classes of depreciation develop quickly, so that for the larger part of the time used, the service value of property will approximate the cost.

**Present Value.**—The term refers to the fair value of the property at the period being considered. Though not always so, present value usually means the original cost or cost to reproduce, reduced by the amount of either absolute observed depreciation or theoretical computed depreciation, or sometimes the sum of both of these items.

**Original Cost.**—Original cost may be taken to mean the sum of all actual expenditures made to date on a given property—preferably termed investment cost—but more usually it refers to the actual cost of the present existing evidenced items of property.

**Cost to Reproduce New.**—Reproduction cost as defined by the courts refers to an assumed cost, based on the estimated expenditures necessary for reproducing the property new on the basis of prices current at the time of estimate—prices that fluctuate considerably are averaged for five or more years preceding the date of the appraisal, or adjusted upon some other fair basis—and is made up to include everything that can be inventoried regardless of original cost, age, service value or present condition as affected by depreciation.

**Development Expenses or Overhead Charges.**—In connection with the establishment of any utility property, certain expenditures are necessary for developing and completing the physical property, aside from the cost of structures. These are in addition to those other expenses of developing the business and producing an income. The former non-physical values may be classed as "Development Expenses" or "Overhead Charges," and the latter as "Going Value," but both items relate to costs—intangible because they cannot be seen and handled—and are apart from and in addition to those expenditures relating to the cost of the physical plant. As a class, those expenses incurred in connection with completing the physical property are frequently referred to as "overhead charges," sometimes as "intangible expenses," but as they refer largely to the outlay necessary in getting the physical plant running, the author prefers the quite commonly used term "Development Expenses" which generally cover most or all of the following expenditures:

1. Legal and other expenses of preliminary promotion, incorporation and organization, procuring consents of property owners, condemnation proceedings, obtaining franchises, consents and certificates from Public Service Corporations and other public bodies, sometimes title examination and insurance.

2. Technical expenses in connection with preliminary work, surveys, expert estimates, etc.

3. Interest on capital and bond issues, wages of superintendence and administration not chargeable to construction ordinarily necessary in connection with putting a property in going order, and also sometimes, although not properly so, the deficiency in operating expenses, taxes and fair return until the property is put on a paying basis.

4. Taxes of various amounts including corporation tax, mortgage tax, real estate tax, personal property tax, capital


and State tax, franchise tax, etc., which must be provided and paid before the complete cost of a property is obtained.

5. Discounts on securities, brokerage or other customary and necessary expenditures in connection with financing a utility and marketing its securities.

6. Reasonable promotion profit, possibly also some compensation for risk of capital.

7. Working capital.

**Good-will.**—A monopoly, as is generally admitted, has no good-will which can be evaluated, and the courts have sustained this view. Good-will usually results where competition exists, and the tendency of the times is to make no allowance for this element in a public utility valuation, it being considered that good-will belongs rather to industrial enterprises where its value is determined by the profitableness of the business, namely, "capitalizing the net income."



**Going Value.**—"Going Value," "Going Concern Value," and "Going Concern" are several terms that have been used to refer to an intangible value beyond that of the physical plant attaching to a live, active-operating and revenue-producing property. The value in question is generally held to relate to, and is evaluated from, a consideration of revenue and earnings.

**Depreciation.**—Webster defines "depreciation" as the "act or state of lessening the worth of." The Century Dictionary says it is "a fall in value; reduction of worth." In appraisal work it is used broadly to mean a reduction in utility value expressed as a percentage but more usually in dollars, due to any deterioration in physical plant by reason of:

- (a) Normal wear and tear.
- (b) Age or physical decay.
- (c) Inadequacy.
- (d) Obsolescence.
- (e) Deferred maintenance.

The term depreciation, always used in connection with a reduction of value, has, however, four distinct and separate shades of meaning, so that the term must be qualified when used in order to distinguish which one of the following meanings is intended:

**First.**—The annual amount, expressed as a percentage or in dollars, that should be laid aside to renew or replace the article in question at the time of its abandonment.

*Second.*—The annual amount, expressed as a percentage or in dollars, that should be laid aside to renew or replace the article in question at the time of its abandonment, plus the annual expense of maintenance and repair expended in removing such part of depreciation as is practicable and good economy.

*Third.*—The total amount—usually that estimated as necessary to be expended to put the physical property in perfect operating condition—determined by the inspection and observation of an experienced engineer, expressed in a percentage or in dollars, which must be deducted from the “original cost” or the “cost to reproduce new,” in order to determine the absolute, actual, present value.

*Fourth.*—The total amount—it may be the sum of several years of depreciation—computed from “expectancy of life” tables, more or less authoritative, expressed in a percentage or in dollars, that must be deducted from the “original cost” or the “cost to reproduce new,” in order to obtain the theoretical, present, depreciated value. This value may be increased or reduced by the condition of the property, as determined from inspection.

**Classes of Depreciation.**—The subject of Depreciation, from an engineering—not an accountant’s—standpoint, practically divides itself into several classes, as follows:

(a) *Wear and Tear, or Maintenance.*—This includes such depreciation as may ordinarily be removed or offset by proper expenditures at such time as the worn-out parts may be economically replaced. Few parts of physical property in use ever become completely worn out; after a certain amount of wear, a point is reached at which good engineering requires their replacement; they may be still further used, but only at the cost of economy or safety.

(b) *Age, Physical Decay or Decrepitude.*—Depreciation of this sort is due to the aging of apparatus that usually has a life extending over a period of years. Property that is short-lived usually passes away through “wear and tear.” In many instances, age depreciation will be the same whether the apparatus is used or unused, *i.e.*, a boiler or an insulated wire will deteriorate through the action of the elements practically as rapidly when standing idle as when in continued service.

(c) *Inadequacy or Supersession.*—This class of depreciation arises from increased demands of or opportunity for service so as to render the property in use inconvenient or uneconomical for

continuance of operation, although in every way capable of performing the service for which it was installed.

(d) *Obsolescence*.—Obsolescence means the depreciation of property through the development of something newer and either more economical or more of a fad. Like inadequacy, it may necessitate the abandonment of property long before it is worn out and in many cases, arises largely from demands of the public.

(e) *Deferred Maintenance*.—The several classes of depreciation hereinbefore referred to assume that the property will be kept in good operating condition and efficiency. If the condition of the property is permitted to lapse beyond that of safety or economy in operation there results a condition due to neglect of proper maintenance and regular repairs, a condition known as "Deferred Maintenance."



## CHAPTER III

### FUNDAMENTALS IN VALUATION

**Before and after Regulation Begins.**—In questions relating to rate regulation of public utilities, the determination of value is fundamental. Yet it is with regard to the definition of value that the chief controversy and difference of opinion exists. The general principle that public authorities have the inherent right to regulate utilities is now generally accepted. The present rate of return to be allowed upon the value of the property may generally be agreed upon within reasonable limits. The allowance for operating expenses is not usually a subject of controversy. The fact that something must be set aside to cover depreciation is generally conceded, and the amount thereof can usually be determined fairly accurately. But the value of the property, the amount of which so largely affects the total revenue to be allowed in rate fixing, will be found to vary widely, depending upon the premises used in arriving at the value.

Until within the last few years net earnings have been considered a fair and safe basis on which to predicate the value of a given property. Either market value or par value of stocks and bonds outstanding for a given property have, in many instances, been taken as the value of the property itself. Both these bases have been recognized and approved by the lower and higher courts as authoritative evidences which must be considered in fixing the value of any given property, but with the development and progress of the present era of public regulation, less weight and consideration have been given to net earnings and capitalization in fixing upon the value of utility property to be used as the fair basis upon which to predicate rates. The reasons for this view are just and fairly conclusive. The present day tendency is to determine value primarily either from the amount of the investment which can be shown to have been fairly, honestly and usefully made, or from the estimated cost of reproducing the existing property, either with or without deducting depreciation. Although each of these two methods of determining value has many supporters and adherents, too often the controlling in-

fluence in the adherence to either principle is some element of self-interest. As a matter of fact, both methods of arriving at value, so apparently diverse, are being used, and if properly applied and with a view to doing justice in the premises, both may be approved. The principal differences of opinion that exist, then, between the various authorities attempting to establish proper methods of valuation and rate-making, relate to proper interpretation of the meaning and application of value new, and the proper use of estimates of depreciation. The reason for these differences of opinion are due primarily to the failure to distinguish between:

(a) Principles that should be applied in reference to long-established and existing utilities.

(b) Principles that should be applied with reference to utilities newly created under commission regulation, or that may be created in the future.

The serious question at present is, not what possible theories and methods may be developed for ascertaining the value and determining the depreciation of utilities yet to be created, but rather what methods of valuation shall be followed in appraising the many existing and long-established utilities.

Probably everyone would agree that any specific rulings may be correct, provided they are applied only to newly created corporations in which investors placed their money after due notice as to the methods that would be applied and the returns which would be securable therefrom, but it is absolutely unfair, and probably illegal, to attempt to saddle untried, theoretical methods upon innocent owners who invested their money under conditions and upon assumptions entirely different from those now proposed.

The fact that new and unaccepted conditions cannot afterward be imposed upon a utility which has made an investment upon definite premises, is not only in line with court rulings but even past misdeeds have been excluded from consideration in fixing the basis of present valuation.

"But in this process of condemnation of property, the owner is not to be punished for past misuse of it."<sup>1</sup>

The unfairness and illegality of attempting to apply *ex post facto* rulings to utility regulation is ably stated by Commissioner

<sup>1</sup> Kennebec Water District vs. City of Waterville Et al., 97 Me., 185.

Eshleman, Ex-President of the Railroad Commission of California, in dissenting from an opinion written by his fellow Commissioner, Mr. Thelen, in the following language:

"While I do not for a moment question the power of any governmental agency to impose conditions in advance on any business requiring governmental sanction to be carried on, on the acceptance of which conditions may depend the right of any person or corporation to conduct such business, yet I do not conclude that this power to impose conditions in advance necessarily implies the power to impose added conditions on a business already operating under governmental sanction after such business has assumed all the obligations required by law to be assumed at the time of the initiation of its enterprise. For example, I am very sure that a condition in a franchise to the effect that never shall the agency accepting such franchise capitalize it or claim value for it at more than its cost, or any value at all for that matter, would be good and enforceable against the agency accepting such franchise. Likewise do I believe that a condition in a franchise requiring the one accepting the same to account as agent to the authority granting such franchise would be equally valid. It would have simplified matters immeasurably, both for public utilities and public authority had such public authority been far seeing enough to have attached conditions to all gifts, such as I here suggest, but failing to do so in advance, I very much doubt the power of the State to impose them now. I, of course, should not be understood here as urging that the State lacks all power to impose conditions on corporations or persons engaged in any kind of business at a subsequent stage of the existence of such business, which it did not impose at the initial period. All agencies, of whatsoever character, embark on their enterprises in full legal contemplation of the power of the State, should the need arise, to exercise every governmental function which the State may at any time exercise and the subsequent necessity for the government to act in any particular way it may be called upon under its power to act, is as a condition subsequent accepted by all who live under government. The general authority of a State of this Union, under its police power, or the Federal Government under any of its delegated powers to impose conditions upon a business at any stage of its existence, is not that to which I here refer. All readily agree that such authority is a general condition imposed at the beginning and always existing. But unless referable to the police or other general power of the State of California, this State has no power to impose conditions on any enterprise which has lawfully acquired its property and initiated its business except as a condition precedent imposed upon such enterprise in the beginning, unless the owners of such enterprise voluntarily accept such condition. In other words, the State has the right to say

in advance upon what conditions a utility enterprise may initiate and conduct its business and may, as a part of the contract, impose conditions on the acceptance of which the agency so accepting becomes bound thereby, but failing to do so in advance the only conditions that may be imposed thereafter are those conditions authorized and justified by the police power. It is my belief, therefore, that the failure of the State to impose conditions in advance divests it thereafter of the power of imposing such conditions unless the police power authorizes such imposition.

I feel it best to meet this squarely rather than delude ourselves longer in the belief that we as a people may continue safely to divest ourselves of things of value with no return until all the common store is exhausted, in the belief that our mistaken generosity will be reciprocated by those accepting our gifts. They will not reciprocate, and under the law they may not be forced to give back that which we have so foolishly and bounteously granted."<sup>1</sup>

There is a general tendency to ignore the fact that newly organized utilities, originated under present-day regulation cannot be treated the same as long-established utilities which have been created and operated without much restriction as to their tariffs or rates of return. To undertake to establish an intelligent and fair basis for fixing rates, there must be drawn a sharp line of demarcation between those principles that may be applied to a corporation existing and long-established, or one which may be originated, under newly inaugurated, public-service regulation. This does not assail or refute the principle that in both cases present value is to be determined, but it does recognize the fact that methods of getting at the present value may properly differ.

Where utility property has been constructed and put into operation before the creation of regulating commissions, the investors, with the consent of municipal, state or federal authorities and the sanction of the public at large, were allowed to do certain things which are no longer permitted under utility regulation. For example, the utilities have generally been allowed to take as earnings and use, as the property of the owners, all revenue above that required, in the opinion of honest directors, for paying operating expenses, interest and taxes or the accumulation of surplus. Since the origin of public regulation, due in some measure to the fact that certain corporations, through their directors, have used poor judgment or violated their

<sup>1</sup> Decision of the Railroad Commission of California, *Town of Antioch vs. Pacific Gas and Electric Company*, Case No. 400; Decision No. 1655; July 6, 1914.

fiduciary relations or have rendered abnormally poor service, there has resulted a demand that the corporations not only maintain their properties in first-class operating condition, but in addition accumulate reserve funds which shall be held in cash, property or its practical equivalent. This innovation and the setting up of new rules by public service commissions or other authorities may not be questioned and is eminently fair as to the application of future revenue, provided the corporations are permitted to make earning sufficient to carry out such program, but the attempt to confiscate property by the application of such rules to the past is not fair and cannot be sustained.

This is by no means claiming that because owners have, in the past, taken all earnings and made no provisions for renewals and replacements, the entire cost of such renewals and replacements must necessarily be paid for by the public in addition to a fair return on the value of the property. If, as is the case with many existing utilities, the earnings in the past have been insufficient to pay more than operating expenses and a fair return on the full value of the property, then the public not heretofore having provided sufficient to cover anticipated depreciation, must have the cost of all future renewals and replacements included in future tariffs. On the other hand, if the public has been paying sufficient to provide both fair return and an allowance for depreciation, both of which amounts have been taken by the owner as profits, that portion of the total taken, which is applicable to the depreciation account, must be provided by the owner at the time renewals and replacements are necessary, either by foregoing all or part of his future return or providing cash from outside sources without increasing the investment or property values upon which rates are fixed. In any number of cases, stockholders are doing this very thing, viz.: foregoing dividends to provide renewals, and such method of maintaining property in no way controls the basis of rates. Where a corporation is created and the money of the owners is invested, after notice, under conditions prescribed in advance by regulating bodies, there can be no fair or honest objection to the insistence upon accumulation of depreciation funds out of revenue and the use of such funds in any reasonable way, but they cannot necessarily be used as a measure of the present value of the property on which rates are to be fixed.

With respect to corporations that have been in existence for a considerable period of time without commission regulation, and have been following certain generally accepted principles with the acquiescence more or less definite, of public authorities, it is manifestly unjust to determine value for rate-fixing purposes by deducting from the cost of reproduction new, a computed but not accumulated amount of theoretical depreciation, which it is assumed should have been amassed in a so-called reserve fund. Such method after notice by the regulating body, may possibly, under some circumstances, be reasonable when applied to certain newly organized corporations, but they are unfair as applied to most existing corporations. That the same rules may not fairly be applied equally to all utility corporations, thus so differently originated, has been recognized by the Railroad Commission of California.

"We find a condition brought about by proceedings which took place before the Public Utilities Act went into effect which probably we would not have authorized in their present form. The applicant desires now to go forward from this point and to take other steps which in our opinion, standing alone, considerations of public policy would not prevent." (Page 138<sup>1</sup>.)

"Heretofore, in dealing with its financial affairs, we have imposed certain conditions with a view to the ultimate consummation of the objects for which the company was formed, but have been more lenient in this regard than we would be if the enterprise were one which had its inception after the passage of the Public Utilities Act." (Page 665<sup>1</sup>.)

Public utility properties can be operated satisfactorily to the owners, and can be made to render reasonable and adequate service to the public, under either of the methods of regulation and control referred to, namely:

(a) An assured return, commensurate with the nature of the guarantee, upon the investment made by the owners.

(b) A variable return, commensurate with the risks of the business, upon the present fair value of the property used.

The present trend of public service commission rulings is toward the former, that is, the investment cost; nevertheless, such basis is not sanctioned by the United States courts. The United States Supreme Court, in a long line of decisions, has adhered to present value and not original cost as the proper basis upon which to fix rates. This divergence of view and fundamental difference in the

<sup>1</sup> Reports Railroad Commission of California, Jan. 1, 1911, to Dec. 31, 1912.

rulings and decisions of these two classes of authorities must be kept clearly in mind in all valuation work, particularly where the values determined are to be passed on by the courts.

To arrive at impartial fairness in regulation, it must be recognized that the public utility companies are not starting simultaneously with utility regulating commissions. Regulation enters the field with the utility corporations already in full swing. In well-established, going utilities speculative profits are not necessary for the future but have been in the past. Public regulation in fixing the allowable value is apt to consider only the present and forget the speculative element. The fact that a different status exists as to corporations before and after public regulation begins is clearly recognized by the Interstate Commerce Commission.

“\* \* \* if any government tribunal is to do justice between the railway and the public, if it is to feel any confidence in the correctness of these conclusions, this supervision must be continuous and not spasmodic. There must be some point of departure and from that point knowledge of the government must be accurate and complete. After earnings have been ‘capitalized’ and benefits have been ‘completed,’ when the various independent organizations have been perfected, it is impossible either to know or to undo.”<sup>1</sup>

The point to be made clear is that no *ex post facto* rulings should be attempted or countenanced by commissions or other authorities simply because, for example, a corporation has no depreciation reserve fund in hand. Who shall say that, because utilities had not accumulated reserve funds before the present character of public regulation was instituted, therefore, the corporations shall now be deprived of a part of the value of their property. In determining rates where the public and corporations have consented to the existence of a certain thing in the past that is not legally or criminally wrong, and about which there still exists honest differences of opinion, it is not fair or right, in making rulings for the future, to attempt to apply such rulings to the past at the sacrifice of investment or the jeopardy of income. It is on this point—the difference between a corporation already in existence and one originated under new laws—that the mistakes have been made in the rulings of commissioners, very many of whom, inexperienced in utility corporation affairs, have

<sup>1</sup> Decision of the Interstate Commerce Commission, *Spokane vs. Northern Pacific Rwy.* Co. 15 I. C. C. R. 416.

attempted to apply theoretically perfected methods which are largely the result of development and experience. It is the old truth, that the same medicine will make some men well and others ill.

**Competition.**—In attempting to establish principles, it must be recognized that while there are certain general applications that relate to all utilities, there are special considerations which apply to particular classes of utilities and which do not hold for other classes. A utility that is entirely local in its interests, as for example, a municipal water-works system, or a local electric-light or gas company, may properly have its rates fixed without much regard to the rates being charged by similar utilities in other localities where operating expenses may be lower or higher, the quantity and local habits of use of service, or the amount of investment required is entirely dissimilar. In instances where such monopolistic utilities are being considered, the principles to apply are not in all respects the same or comparable in ascertaining fair rates, that hold if competition is allowed to prevail. The rates to be charged for local service by a local monopoly is distinct from, and not controlled by, the rates permitted in some other locality; the local rates may primarily be determined from a consideration of the value of the property but such basis alone will not apply where competition exists, as in the case of two or more railroads operating between the same terminals. Under such competitive circumstances, the rates for one road must necessarily be fixed from a consideration of what is charged by the other road and perhaps without much relation to the value of the respective railroads.

For example, between New York City and Buffalo, there are five steam railroads, with entirely different grades; some traversing valleys and being fairly level, while others have heavy grades. One is a four-track road of the best type of construction; the others have less track capacity, but represent a greater or less investment per unit of length, on account of tunnels, or other local conditions; nevertheless, the rates for freight are identical between the two points named over all of these routes, and except for slight differentials with regard to one road, the passenger rates are the same. A valuation of the properties of these five roads would show greatly varying investments, and yet, in order to maintain their respective amounts of business, the roads must continue to make the same charge for the same service, although



that charge may in the one case earn a handsome return to the investors and, in another case, hardly earn operating and depreciation charges. The Interstate Commerce Commissioners have recognized this condition of affairs and stated that rates cannot be based on valuation alone, although that necessarily is one of the elements to be taken into consideration.

"With the railroad, however, this is entirely different for the reason that it seldom happens that a single railroad can be considered by itself. The greater part of the business of the railways of the United States is subject to competitive conditions of one sort and another which are largely controlling so that the rates of one are necessarily bound up with those of another. A moment's thought will show the extent to which this is true."

"It is impossible to shake a single railroad free from every other and fix its charges upon the basis of a fair return upon its fair value as you would in case of a gas or water plant. The rate established for one, of necessity influences and frequently absolutely determines the rate of all, a fact which must never be forgotten in discussing the subject."<sup>1</sup>

In attempting to get at the value of utility property certain peculiar or local qualifying conditions may fairly modify the results.

"The first railroad which the Commission is proceeding to survey in what is known as the Pacific District is the San Pedro, Los Angeles & Salt Lake, extending from San Pedro, California, to Salt Lake City, Utah, some 800 miles. Most of this road has been built in comparatively recent times, and the circumstances and cost of construction are fairly well known.

"The course of the road is for the most part through an arid desert. A certain section of it, when built, was located where no man thought it could ever be disturbed by floods, yet shortly after it was opened for operation the floods came and carried out this portion. It was at once reconstructed upon a new location supposed to be beyond all possible danger from a recurrence of the previous disaster, nevertheless the waters again came and washed away this same section; whereupon it was rebuilt upon a third location, beyond all possible reach of future trouble from this source.

"Considering the nature of the road and the people who were interested in its construction, it seems probable that due caution was exercised in the original location; that is, that a reasonably prudent man building this railroad as those men did, to be operated by them as

<sup>1</sup> "The Valuation of Railroads" by Hon. C. A. Prouty, delivered before the Second Annual Meeting of the Chamber of Commerce of the United States, Washington, Feb. 11, 12 and 13, 1914.

a railroad, would have located it as it was located. It is undoubtedly true that the second location was made with great care, and was believed to be beyond possible danger. It has cost a large sum more to rebuild this road than it would have originally cost to construct it where it is to-day. Now in determining the value of this property, what, if any, allowance is to be made for this experimental outlay? If the government itself had constructed this railroad it probably would have had the same experience and would have expended the same amount of money which the owners actually did.

"This illustration puts the question in a very striking form, but the same idea enters more or less into the valuation of most of the railroads of this country. There has of necessity been a certain amount of experiment before hitting on the right and proper thing. Does this development expense substitute an element of value which may be recognized to-day, or must the owners of these public utilities stand the loss of their mistakes in the same way that the owner of a private enterprise would? Vast sums of money are involved in the answer to that very simple question.

"Take another illustration of a different character. Some years ago in a case pending before the Commission the Northern Pacific Railway Company had occasion to prove the value of its property, and it did so by showing the cost of reproduction. For this purpose it gave the units which entered into that railroad as it then stood. Among other things it showed the amount of land upon which its right-of-way was located and what it would cost to acquire that land for railroad purposes at that time, claiming that this cost of reproduction was the value of the property.

"The Northern Pacific runs through the City of Spokane. When the road was built, that city was of small account but it has come to be of much account, and in the process of development it has grown up on both sides of this railroad. The Northern Pacific claimed, and it may very well have been true, that the cost of acquiring its right-of-way through the heart of the city of Spokane at the time of the hearing would be at least \$5,000,000. The original cost to the railroad was nothing, the right-of-way having been entirely donated either by the Government or by private benefaction. Now to whom belongs this \$5,000,000? Has the Northern Pacific the right to tax the public for a return upon that amount? Whether it has is a thing of great consequence, for nearly one-fourth of the entire value of the Northern Pacific Railway, as shown in that proceeding, was the value of its right-of-way, much of which was due, as in the City of Spokane, to increase in value over its original cost. This question of the unearned increment presents in the valuation of our railways a difficult problem.

"Illustrations like those two might be indefinitely multiplied, but these are sufficient to exhibit the thought I wish to emphasize, namely,

that this valuation of our railways is not a mere engineering problem, involving the cost of reproduction or the amount of depreciation alone. Indeed, it is not properly an engineering problem at all, but rather a social and economic problem; a legal problem; in its final analysis a political problem. It is for the Commission first of all to ascertain all these facts, and from them to deduce what in its opinion is the fair value of the properties.

"To marshal every fact obtainable with respect to the present condition and the past history of our railways, and from a just consideration of all these facts to determine the fair value of the properties to-day."<sup>1</sup>

It will be seen that the rates charged by one road cannot be fixed by it, or even by the Interstate Commerce Commission, without consideration of what other roads will charge for similar traffic between the same points, otherwise such a road would immediately begin to attract or drive away business to the detriment or advantage of the competing lines. This matter was very clearly demonstrated in the Minnesota rate cases, where the Supreme Court ordered the Great Northern and Northern Pacific Railroads to reduce their rates between certain points, although permitting the St. Louis and Minneapolis Railroad to continue the existing rate. The latter road, unable to continue getting its business at the higher rate, was compelled to meet the reduction made in accordance with the Court's order by its two competitors and therefore, reduced its own rates, although thereby it was unable to earn a fair return upon the value of its property.

Hence it will be seen that rate-making in connection with purely local monopolies may proceed on one basis that is different from that which can be assumed as applicable to utility properties competing with one another.

Until comparatively recent years, corporations, like individuals, have been permitted to largely regulate their own affairs. With the development of corporations that have gained complete, or practically complete, control of any given line of commercial activity, there has arisen a popular demand for the restriction, regulation, or disintegration of such monopolies. This recent demand, called socialistic by some, is so contrary to what custom had previously permitted, and even courts had sanctioned, that many still believe the rights of the monopolistic corporations

<sup>1</sup> "The Valuation of Railroads" by Hon. C. A. Prouty, delivered before the Second Annual Meeting of the Chamber of Commerce of the United States, Washington, Feb. 11, 12 and 13, 1914.

have been infringed and their property is being confiscated, as the result of governmental regulation or disintegration. Where *bona fide* competition exists it usually succeeds in forcing satisfactorily low rates in industrial enterprises and it is in the attempt to restore former conditions of free competition that the Sherman Act was passed by the Federal Government. Its enforcement it is still hoped by many, will succeed in restoring free competition, with its accompanying lower prices and the former incentive and stimulus to invention and development in industrials, but competition has been shown to be and is generally accepted to be the wrong method by which to control public utilities.

While it may be considered doubtful whether the artificial dismemberment of monopolies can result in restoring *bona fide* competition, there is no question but that in many instances monopolies are desirable. They avoid duplication of investment, usually reduce charges per unit manufactured, proportionately reduce overhead, non-productive expenses of a corporation, and eliminate the losses frequently involved in real competition, which losses the public, or the investor, must ultimately bear. Whatever may be accomplished in the way of maintaining competitive conditions between individuals or corporations engaged in the same lines of business, monopolies must of necessity always exist in certain business operations. Such monopolies should be recognized as desirable and beneficial as their work cannot be done equally well under competitive conditions; for example, in the telephone business, the electric light and power business, the surface railway, the gas or water-works business for towns and villages, and even most cities. Where monopolies are recognized as proper and permitted to exist, regulation of rates by governmental authority follows almost as an axiom. Monopolistic corporations are granted franchises, frequently also, the right of eminent domain, they are given the use of the streets and public highways, with other privileges entirely unique and distinct, so that they may properly be held strictly accountable to the public which has given them such endowments. As their business is practically assured, free from competition, as long as the service rendered is of first-class quality, they are not entitled to charge unfair or exorbitant rates and their earnings may properly be reduced to a fair return on the value of their property being used for the service of the public.

This condition holds, not only with regard to monopolies, that may be formed in the future, but also with respect to those already in existence, provided in fixing the return allowed the latter corporations, consideration is given to the fact that they created investments under more hazardous conditions than those existing under a rate of return now considered fair.

In considering values found by appraisals for the purpose of determining the fair rate of return to be allowed competing utilities, such as steam railroads, there must also be recognized the fundamental fact with regard to the existing tariffs, namely, that tariffs between certain competing centers are absolutely the same irrespective of the distance or the route, or the value of the property used. In many instances, this equality of tariffs, regardless of distance, results from natural commercial conditions; for example, the tariffs from New York to any one of a series of cities on the Mississippi River is 125 per cent. of the tariff from New York to Chicago, whether that city is practically west of Chicago, or west of New Orleans. In the same way, shipments from Boston to Chicago might move via Asheville, N. C., over a route 1,786 miles in length, with the same charges, as over the direct line only 1,004 miles in length.<sup>1</sup>

These uniform tariffs are maintained in order, first, to prevent rate wars, which would result in bankruptcy to the least favored lines, and second, to permit the delivery of merchandise of similar characteristics from widely divergent points to the common center, or *vice versa*. Thus it will be seen that, not from choice, but because of economic reasons, the existing type of discriminatory railroad tariffs have been built up and developed and must be maintained to permit commerce to move freely in every direction and to maintain markets at a parity, thereby practically eliminating distance over wide areas for interstate commerce. Under such conditions "regional rates" are properly determined and fixed from a consideration of the value of the various properties affected.

If rates are determined by the value of the railroad having the least investment, what will become of the railroad with the large, or perhaps excessive investment? On the other hand, if a fair rate is allowed the railroad having the largest investment, the line having the least investment will obtain unduly large profits and be tempted to cut rates and thereby still further increase

<sup>1</sup> Senate Committee, 1905 Digest, App. LL, page 10.

its business and earnings. Evidently, valuation alone, for competitive railways, cannot be considered as a basis for fixing rates. Other considerations must be the time required in rendering the service, the quality of that service, the density and direction of traffic, competition, the requirements of the isolated communities, along the lines of the respective railways and worth of the service.

That competition between railroads, but also from that due to water transportation, is a governing factor in fixing railroad rates, regardless of the fair value of the property in service, has been recognized by the Interstate Commerce Commission in more than one case.

*“First.*—Is it true that the long-distance rate is forced by water competition? The evidence in this case conclusively shows that wool is transported from Pacific coast terminals to New York for not exceeding 65 cts. per 100 lb. It is plain that rail carriers could hardly maintain a rail rate exceeding the present dollar charge. We find, therefore, that water competition does force the rate of \$1 from Pacific coast terminals to the Atlantic seaboard.

*Second.*—Is the long-distance rate which has been established in view of water competition less than would otherwise be reasonable?

Upon this point the finding must be that it is. This rate applies for a distance of 3,000 miles, and we have held in this proceeding that \$1 would be a reasonable rate for a very much less distance over these same lines.”<sup>1</sup>

While competition may force such low rates as between steam railroads for example as to prevent even a fair return on the physical value of the property used in rendering the service, such basis of return on the value of the physical property of utilities generally, is usually not considered fair and adequate earnings.

The principles are very clearly discussed in the following extract from the Commission reports, and the general statements not only apply to rate-making for railroads, but also for monopolistic utilities, such as electric light, gas and similar corporations:

“Is a rate unreasonable because it does not pay its full share of taxes, fixed charges, and dividends? At the end this is the question to which we come in this case. The carriers themselves having fixed these rates under the mandate of the law that they shall fix just and reasonable

<sup>1</sup> Opinion No. 1830 in the Matter of the Investigation of Alleged Unreasonable Rates and Practices Involved in the Transportation of Wool, Hides, and Pelts from Various Western Points of Origin to Eastern Destinations.

rates, have they justified higher rates by showing that the existing rates which they had fixed fall somewhat short of meeting all the related expenses which the carrier must bear, not only for transportation but to secure an adequate return upon its property? Let us see where this doctrine would lead. If a carrier may raise all rates to a basis where each will bear its share of cost, including all costs, and no lower rate is reasonable, then it must follow that all rates are unreasonable which yield to the carrier a greater return than such cost. Under such theory what would be the rate on tea or silks, or high-priced horses, or delicate machines? Is there to be no classification of freight excepting upon the basis of cost of transportation plus insurance risk? If so the tariffs of every railroad in the United States must suffer a revolutionary change. In all classification consideration must be given to what may be termed public policy, the advantage to the community of having some kinds of freight carried at a less rate than other kinds. And this is the true meaning of the phrase 'what the traffic will bear.' It expresses the consideration that must be shown by the traffic manager to the need of the people for certain commodities. He accordingly imposes a higher rate upon what may be termed luxuries as compared with that imposed upon those articles for which there is a more universal demand. He also gives consideration to the fact that the rate so imposed enters into the ultimate price to the consumer to but a small degree when the article is one of high value, and that those in the community who can afford to purchase such articles can well afford to pay a rate greater than that which could reasonably be imposed upon the general public for commodities of common use. In this sense what the traffic will bear and the value of the service are analogous. No one would claim that a carrier was violating its duty under the law in charging three times the rate upon oriental rugs that it imposed upon cotton. This would not be undue discrimination as between commodities, even though it costs no more to transport the rugs than it did the cotton, assuming both to be carried at the owner's risk, for the one does not compete with the other, and one may reasonably bear a higher rate than the other upon public grounds. It must be, therefore, that this Commission, under the amendment to section 1 passed by Congress in 1910, giving to us the control of freight classification, has power to determine the reasonableness of the differences that are made between the rates made applicable to the various kinds of commodities transported. We may not say that a rate shall be fixed so as to meet the requirements or needs of any body of shippers in their efforts to reach a given market, nor may we establish rates upon any articles so low that they will not return out-of-pocket cost. Neither could we fix an entire schedule of rates which would yield an inadequate return upon the fair value of the property used in the service given. There is, however, a zone within which we may properly exercise 'the flexible limit of judgment

which belongs to the power to make rates.' These are the words of the Chief Justice of the Supreme Court, 206 U. S. 126. There is no flexible limit of judgment if all rates must be upon a level of cost, and out of every dollar paid to the carrier must come a fixed amount of return for capital invested. The recognition of such a doctrine has never been suggested either by Congress or the Supreme Court. A just and reasonable rate must be one which respects alike the carriers' deserts and the character of the traffic. It cannot be a rate that takes from the carrier a profit and thus favors the shipper at the carrier's expense, nor is it one which compels the shipper to yield for the transportation given a sum disproportionate either to the service given by the carrier or to the service rendered to the shipper. The words 'just and reasonable' imply the application of good judgment and fairness, of common sense and a sense of justice to a given condition of facts. They are not fixed, unalterable, mathematical terms. Their meaning implied the exercise of judgment, and against the improper exercise of that judgment the Constitution gives protection, at least as far as the carriers are concerned."<sup>1</sup>

**Purpose Affects Valuation.**—Now, that the general public has become interested in the subject of valuations, there is being evolved a large amount of superficial, unscientific propaganda.

Although specialists in engineering, economics, accounting and law, have been discussing and applying methods of valuation for the past 15 years, or more, and although the State of Texas made an appraisal of its steam railroads over 20 years ago the relative amount of property appraised, compared with the total investment in utilities throughout the United States, is comparatively small. In fact, there has been so much difference of opinion between those having to do with the subject that at present there cannot be said to be unanimous agreement, even on the principles involved.

It is frequently claimed that the valuation of utility property should be the same regardless of the use to be made of the valuation. In a broad sense this is true. A utility, however, may own property, a portion of which is not used in rendering service to the public and, while the value of the entire property could properly be considered in a capitalization case, only the value of such property as is used in the service rendered could be considered in a rate case, so that the two reported values would be different

<sup>1</sup> Report and Order of the Commission, No. 1806, page 623; In the matter of the investigation and suspension of advances in rates for the transportation of coal by the Chesapeake & Ohio Railway Company, Baltimore & Ohio Railroad Company, Norfolk & Western Railway Company, the Kanawha & Michigan Railway Company, and their connections.



depending on the use to be made of the valuation. Similarly, the laws of many States indicate special valuations for purposes of taxation, and these laws differ among the different States. Consequently, in any valuation, the basis upon which it is to be made and the way it is to be used must be considered.

"If it is decided that a public utility should be taxed on its total value as a going concern—that is, its commercial, market or sale value—then franchise and going value will be included. If, on the other hand, the public-utility plant is to be taxed precisely as other real estate, the cost of reproduction less depreciation will be the basis. There is no inherent inconsistency in using one method of valuation for tax purposes and another method for rate purposes."

"Different methods of estimating the value of property may properly be employed when it is valued for different purposes."<sup>1</sup>

It is unquestionably true that a valuation determined solely with reference to the specific case and particular purpose for which the valuation is necessary, alone meets the condition, "fair value." The courts have recognized the truth and reasonableness of this statement and they have rendered decisions having in mind whether the valuation is for purposes of purchase and sale, or taxation, or rate-making, or capitalization. It may happen that the fair value will be found to be the same for one purpose as another, but not necessarily so.

"It appears to us that considerable confusion in the discussion of the subject of valuation \* \* \* arises from a confusion of the terms 'cost' and 'value.' Cost is a definite amount regardless of purpose. The actual cost and the reproduction cost of any structure may be determined without reference to the purpose for which such estimates may later be used. This is what is often meant when it is said that valuation should be the same regardless of purpose. All that is really intended is that actual cost or reproduction cost should be the same. But cost is not necessarily value for any purpose, though it is an element in estimating fair value for almost any purpose. Thus fair value for rate purposes may be based largely on actual cost or on reproduction cost, or on a composite of actual cost, and reproduction cost."<sup>2</sup>

Value for rate-making can seldom, if ever, properly be used as the value in the case of purchase and sale. If, in the latter case,

<sup>1</sup> Ex-Commissioner M. Basset, National Association of Railway Commissioners, Washington, D. C., Oct. 10-13, 1911.

<sup>2</sup> *Proceedings of the 23rd Annual Convention*; page 145, October, 1911; National Association of Railway Commissioners.

there was included with the title to property transferred, a cash reserve fund equal in amount to the difference between the present depreciated value of the property and its cost of reproduction new, then only in such case would the sales value be the same fair value that properly should be used for rate-fixing purposes. It is possible that in the future, under Public Service Regulation, accumulated reserve funds, corresponding to the total amount of estimated depreciation on the property may be held to be a part of the property but usually, under existing conditions, the purchaser of utility property must assume the obligations to make good, in the future, all accruing depreciation, to cover which few existing utilities have sufficient reserve funds in hand.

For purposes of capitalization, there must usually be allowed an appreciably larger value for the par value of securities than the valuation of the physical property plus all intangible charges, due to the fact that bonds are almost always sold below par value; in some States, stock is legally so sold.

It is true that in some instances, the courts, even the Supreme Court, have implied that a lower value is properly allowable for purpose of rate-making than in case of sale, but the more recent rulings do not seem to sustain that view. As a matter of common sense, the reverse of such ruling would more nearly accord with common practice and experience. No investor will pay a higher price for a property than that upon which he will be allowed to make earnings present and prospective. If such earnings or rate of return is fixed by the courts at 5 per cent., for example, on the appraised fair value of the property, when money is earning 6 per cent., the price the investor will pay for such property is less than fair value as determined by valuation; consequently, the sale price to any intelligent buyer will never be larger than the value allowed for rate-making. In this connection attention should be called to the anomalous position that has been taken by courts in holding—very properly—that utility corporations must even against their wishes, make extensions and additions to keep up to and meet the demands of the public but, nevertheless—it would seem very improperly—refusing, as the Supreme Court has done, to protect the utilities against reduction in rate as long as the earnings are sufficient to provide merely a “fair return” upon their property, which must be taken to include such extensions as have been ordered. When “fair return” is held to be practically 6 per cent. as in the Consolidated

Gas Co. case and only  $4\frac{1}{2}$  per cent. ( 6 per cent. less  $1\frac{1}{2}$  per cent. to cover estimated depreciation) as in the Knoxville Water Co. case, free capital cannot ordinarily be induced to invest, and additional capital is only obtained on such basis by corporations existing under the most favorable conditions or because they are able to offer preferred securities. Either of these bases, however, cannot be considered a fair and proper basis upon which to fix a fair rate of return for the ordinary property, or the entire value of utility property.

Value for rate-making will result in a different amount than value for sale or for taxation. Abstractly the value of the same items must be the same, but the purpose supplies the adjective which modifies the final result.

It is inconsistent to include in the value for taxation the intangible property of utilities when the value of other property excludes the same or similar intangibles. Again there may be fundamental differences between public utilities and industrial corporations; for example, in the former the total revenue may be but one-fifth the value of the property upon which taxes are assessed, while with the latter class, the revenue may be five or more times the value of the assessed property resulting in taking from each dollar of revenue of the utility twenty-five times the amount taken from that of the industrial corporation. If under-valuation for purposes of taxation is permitted for other property, utility property should be similarly equalized.

In the matter of value for purpose of taxation, conflicting decisions have been made; for example, the County Assessor of Salt Lake County, Utah, held in the case of the Bingham & Garfield Railroad that although the road had a considerably larger revenue, was a costly one to build, on account of difficult engineering problems, and while on the basis of either reproduction or investment cost the value of the property would be very much higher than the Bingham Branch of the Denver & Rio Grande Railroad, nevertheless, that was no reason why the former road should be required to pay more than its share of taxation, as both roads were operated between the same points and doing similar business at the same rates.

On the other hand, Judge Williard of the United States Court, sitting in S. Dakota, held in one case with certain express companies as to the value of their property set up as a basis of taxation, but in a second and later rate case indicated that any

attempt to increase the tax values previously established, for the purpose of rate-making, was an attempt to trifle with the Court, concluding that the values set forth at the tax hearing must govern in both cases.

Thus it will be seen, except in the last case cited, the term value has different meanings in connection with public utility properties, the same as in ordinary commercial business. As steel has no value for food purposes or wheat as structural material, their value depending upon the use to which they are put, so the value of utility property depends upon its use; the purpose of the valuation must ultimately determine the value.

"We are dealing, not with exchange values, but with the value upon which the Company is entitled to earn a return."<sup>1</sup>

**Gifts and Donations.**—The Constitution of the United States, by the Fifth Amendment, provides:

"That no property shall be taken for public use without just compensation."

and by the Fourteenth Amendment:

"That all persons shall be entitled to equal protection of the laws."

These rights must be respected by the United States Government itself as well as by the State legislatures and all public authorities or courts. It makes no difference whether the rightful owner has purchased or been given his property, neither the whole of it nor any part of it can be transferred or taken without just compensation. It is immaterial whether the property has been paid for out of earnings or has appreciated in value. It makes no difference whether controlled by private individuals or owned by corporations, it cannot be confiscated despite any act of Congress or other legislative body. If the value of the property used must be considered in determining rates, the fixing of rates based on a value of the property which excludes any portion of the whole property because it may have been donated, paid for out of just dividends or accrues from appreciation in land, results in confiscation, takes from the value of the property owned, and is therefore illegal.

"These cases all support the proposition that while it is not the province of the courts to enter upon the merely administrative duty of

<sup>1</sup> Judge Miller of N. Y. Court of Appeals—*People ex rel Kings Co. Lighting Co. vs. Wilcox et al*, 210 N. Y. 479.

framing a tariff of rates for carriage, it is within the scope of judicial power and a part of judicial duty to restrain anything which, in the form of a regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property. There is nothing new or strange in this. It has always been a part of the judicial function to determine whether the act of one party (whether that party be a single individual, an organized body or the public as a whole) operates to divest the other party of any rights of person or property. In every constitution is the guarantee against the taking of private property for public purposes without just compensation. The equal protection of the laws, which, by the Fourteenth Amendment, no State can deny to the individual, forbids legislation, in whatever form it may be enacted, by which the property of one individual is without compensation wrested from him for the benefit of another, or of the public. This, as has been often observed, is a government of law and not a government of men, and it must never be forgotten that under such a government with its constitutional limitations and guarantees the forms of law and the machinery of government, with all their reach and power, must in their actual workings stop on the hither side of the unnecessary and uncompensated taking or destruction of any private property legally acquired and legally held."<sup>1</sup>

The Supreme Court of the United States, as recently as last June, rendered a very important decision reaffirming its earlier decisions to the effect that property owned by a utility belongs to it, regardless of the fact that it was donated. The case arose through the attempt of the Federal Government to compel forfeiture of the unsold portion of the Oregon & California Railroad land grant amounting to 2,300,000 acres, valued at more than \$30,000,000. In its suit the Government charged that the railroad company had forfeited its rights by having violated a provision which required it to sell in not more than 160-acre tracts at a price not exceeding \$2.50 an acre, and only to actual settlers. The Government sought to prove that the company had sold in large tracts to timber companies at more than \$2.50 an acre, and had adopted a policy to sell no more to any purchaser for the time being. The railroad company contended that the provision was not effective because the lands were unfit for settlement, and furthermore urged that the Government could not raise the question of forfeiture because of long acquiescence in the company's disregard of the

<sup>1</sup> *Reagan vs. The Farmers' Loan & Trust Company*, 154 U. S. 362.

selling provision. Judge McKenna, writing the opinion, said that the Government's position, in claiming that the conditions of the grant regarding sales were conditions for which a violation worked a forfeiture, was untenable. The Court held that the conditions were in the nature of "enforceable covenants," and that the Government could not cancel the railroad company's grant. The Court, however, enjoined for a six-month period the railroad company from future sales in violation of the conditions of the grant, so that Congress would have a reasonable time in which to act.

**Free Service.**—Public utilities have frequently been obliged to agree to render "free service" in the form of transportation, lighting, telephone service or power, for which no direct charge is made. The consideration for such "free service" is usually a franchise right to use the public streets or highways, or some other concession assumed to be an equivalent of the service rendered. Of course, such "free service" is not without expense and charge to someone. Where the utilities were allowed to make their own tariffs and charges for service, the gratuitous rendition of a limited amount of service may have come out of the net earnings of the utility itself, and in that way the public, or its agents, were benefited. More usually, however, the granting of favors or "free service" by the utility, resulted in failure to exact all that otherwise might properly be asked of the utility, and thereby the public became the real loser. Under public utility regulation, the cost of "free service" is included with the other expenses which go to make up the total costs of service, so that no real advantage accrues to the public as the rates established will be less in case no "free service" is rendered than when the cost of the "free service" is added and included in fixing tariffs sufficiently high to include these costs. Consequently, the whole question is as broad as long, and there is no advantage in taking money out of one pocket and putting it into another, particularly as such process results in involved questions and increased difficulties of ascertaining proper operating costs.

The general tendency of public service regulating bodies has been to abrogate any obligation on the part of utilities to furnish "free service," even though franchises or contracts so provide. This attitude and action of public authorities has been passed upon and approved by the courts. The legal authorities have

frequently ruled upon the right of the legislature to even abrogate contracts made by municipalities, so that public commissions, the creature of, and acting for the legislatures, undoubtedly can abrogate contracts or franchise agreements between municipalities and corporations, when the latter consent to such abrogation.

In the case of the City of Worcester against the Worcester Consolidated Street Railway Company (see also page 4), the Court passed on the question of whether the company could be compelled, under the clause in its franchise, to pave streets, and the Court assumed that a definite contract did exist between the City and the company, but that, nevertheless, the Legislature, in the exercise of its general legislative power, could abrogate such contract, saying:

"A municipal corporation is simply a subdivision of the State."

"If these restrictions or conditions are to be regarded as a contract, we think the Legislature would have the same right to terminate it, with the consent of the Railroad Company, that the City itself would have."<sup>1</sup>

The above position has been recently affirmed by the New Jersey Court in a very similar case. The Public Service Electric Company of New Jersey, or its predecessor, had entered into a specific contract with the City of Plainfield, N. J., for the use of the city streets for its poles and wires, in return for which the company agreed to

"light by electricity, free of charge, certain municipal buildings, offices and rooms, owned or occupied by the City officers," etc.

The company performed its part of the contract from 1898 until 1913, over 15 years; then the company refused to continue to furnish free light, pleading that the Public Utility Law of New Jersey prohibited discrimination and therefore the company was precluded from carrying out its contract by the statute of the Legislature. The Board of Utility Commissioners of Plainfield made an order directing the company to furnish lights in accordance with its contract, but the company applied to the Court, and the Court rendered a decision, speaking as follows:

"We think, however, that the Public Utilities Act, in forbidding discrimination, made the performance of this contract unlawful, and

<sup>1</sup> 196 U. S. 552.

that, therefore, the prosecutor (the company) could not continue to perform the contract without being guilty of violation of that statute."<sup>1</sup>

The Local Board contended that the furnishing of free lights to the City was not discrimination, but the Court said:

"No other evidence is required or necessary than is furnished by the contract to demonstrate that the preference or advantage given by the contract is undue and unreasonable and within the violation of the Public Utilities Act. The fact that there was such undue and unreasonable preference or advantage given, is sufficient basis to set aside the order made by the Public Utilities Commissioners."<sup>1</sup>

**Agency Theory.**—The "original cost" basis of valuation has been used by those advocating the theory that the property of a public utility belongs really to the public and that the owners are merely the trustees or agents of the public. This theory has been developed and advocated perhaps most strongly by some members of the Railroad Commission of the State of California. In the recent Antioch decision of the California Commission the fundamental principles involved in determining the basis on which return should be allowed were discussed at length. The Commission brushed aside as without warrant the contention of the utility that the basis for fixing rates should be reproduction value new of the company's physical plant plus an allowance for going value. The Commission argued that a utility is entitled to a reasonable return upon money honestly and wisely expended for the public, but that loss due to abnormal conditions, bad management, poor judgment, and lack of ordinary care and foresight must be borne by the utility and not by the public. In developing this phase of the subject, Commissioner Thelen who wrote the opinion, suggested, that in many respects the relation between utility and its consumers may be compared to that existing between principal and agent. While the Commission, in rendering its final decision, accepted the conclusions of Commissioner Thelen, as to values, the president of the Commission, Mr. John M. Eshleman, dissented from his fellow commissioner and characterized this doctrine of agency as dangerous, stating that the Supreme Court would not countenance any finding to the effect that owners of a public utility hold such property as agents. His exact language is as follows:

<sup>1</sup> Public Service Electric Company vs. Board of Utility Commissioners, of City of Plainfield, 93 Atlantic 708.



"The main reason then why I do not accept the able reasoning of Mr. Thelen in this regard is that it will merely serve longer to keep us lulled to sleep until all our valuable public stores and privileges shall have been given away, when we shall awaken to the painful fact that they are no longer ours, just as we are now made to know that the waters of our rivers and streams, incalculable in value, are for nothing the prize of the alert private interest merely because public authority slept.

"The authorities cited do not at all convince me that the Supreme Court will ever hold, when the matter is directly before it, that the owners of a public utility property hold such property as an agent at all. In fact that Court has in several well-considered cases definitely decided that such is not its view. Therefore, if we are to escape excessive unearned increments and rates based upon the gift we have made, it must be on some other theory than that the owner of public utility property is in any proper sense, as to such property an agent."

#### ADDENDA

Since the above was written, the New Jersey Court of Errors and Appeals had handed down a decision reversing the Supreme Court and sustaining the Board of Public Utility Commissioners in ordering the Corporation to carry out the contract of 1898, on the ground that it was lawful when made.

police power, may regulate it both as to the price for which and those to whom it shall accord its service."<sup>1</sup>

Certain utility commissioners, however, are not the only individuals holding that utility property really belongs to the public. Dr. Justice Van Fleet comes out very squarely in favor of this theory in a decision recently rendered in the San Diego Water Company case, where he said:

"As we have said, it is not the water or the distributing works which the company may be said to own, and the value of which is to be ascertained. They were acquired and contributed for the use of the public; the public may be said to be the real owner and the company only the agency of the public to administer their use."<sup>2</sup>

The above expression of opinion has been approved by Commissioner Thelen in the North Coast Water Company case.<sup>3</sup>

<sup>1</sup> Town of Antioch vs. Pacific Gas & Electric Company. Case No. 400; decided July 6, 1914.

<sup>2</sup> San Diego Water Company vs. San Diego, 118 Cal. 556, page 570.

<sup>3</sup> Decision No. 1110 in the matter of the application of North Coast Water Co., for authority to increase the rates for water charged to Belvedere Land Co.

The agency theory is a comparatively recent one and it indicates the tendency of the times and a willingness on the part of the public to depress the value of corporation property without paying the present value therefor. The legal relation between agent and principal always has been that the agent represents the principal, but the latter is responsible. If the utility investors were merely agents, the public as principal would be responsible for operation and management with resulting profits or losses.

Apparently anticipating the future claim that owners of property used in the service of the public were merely agents, the Federal Court years ago held that "the property now under consideration (of the gas company) is as much the private property of this complainant as are the belongings of any private citizen."<sup>1</sup>

The fact that the investor is compelled to assume the loss in case of an unprofitable venture must be considered in fixing the fair rate of return of profitable utilities. That rates cannot be advanced sufficiently to always make a return even on the value of the physical property is well illustrated by the decision of the Railroad Commission of Oregon in the Home Telephone & Telegraph Company case, where the decision says:

"If the Commission should grant authority for the Home Company to increase its rate to the extent prayed in its original or amended applications, the Home Company would lose a large number of subscribers who are now patrons of its exchanges, without gaining any subscribers in place thereof, and the effect would be to decrease the number of subscribers connected, to diminish the value of service to the existing subscribers and not to increase the gross or net revenues of the company in proportion with the increasing rates. It is not possible, either by the schedule of rates applied for or by any other schedule which the commission can name, to yield to the company its present and duly high operating expenses, its taxes, depreciation and any substantial return upon the investment, for the reason that any rates which would yield such return would be so large that the same would exceed the value of the service to the patrons and would be unreasonably high, and the applicant would in consequence lose so many subscribers that neither its gross nor net revenues would be increased."<sup>2</sup>

It is not clear by what process an impartial, judicial mind can reason that properties which have been constructed and paid for

<sup>1</sup> Consolidated Gas Co. vs. N. Y., 157 Fed. 854

<sup>2</sup> Commission files L. U. F. 52-54.

by a corporation and are used in serving the public belong to the owners as "only the agent of the public to administer their use." Certain it is that as yet the majority of the public and the higher courts are not prepared to decide that property used in the service of the public, paid for by the money of private individuals, belongs to the public and administration and operation are the only rights the owners have in such property.

"The 'trustee theory,' so-called, assumes that there exists between the public and every railroad carrier the relation of principal and agent, or of beneficiary and trustee. No such relation exists and the assumption is without any foundation or support."

\* \* \* \* \*

"The right of governmental authority to regulate charges of those engaged in public calling, or to regulate the selling price of commodities—in the cases where such prices may be regulated—rests upon the power of police and not upon ownership, legal or equitable, of the property.

"There is no support in judicial decisions for the trustee theory, or for the idea that the power to regulate in any manner impairs or lessens the title or ownership of him, whose charges or prices are subject to regulation, for the protection of the public against extortion and unfair competition."<sup>1</sup>

<sup>1</sup> Brief filed on behalf of the Railroad Companies represented by the Presidents' Conference Committee before the Interstate Commerce Commission, Sept. 1, 1915.

## CHAPTER IV

### FAIR VALUE FOR RATE-MAKING

**Principles Involved.**—There has been a steady and remarkable increase in the use of utility service which was formerly considered more or less a luxury, for example, the general use of gas, electric light, telephone, street car service, etc. This has continued until the general public, now looking upon such service as an ordinary necessity, is largely interested in the question of charges for the service rendered and whether or not these charges are fair and proper. Owing to the intricacies of utility management, various methods of accounting and the many elements entering into the costs of service, the public generally does not appreciate the varied and necessary indirect expenses, or realize that many charges must be deferred and, therefore, are not apparent in the current weekly or monthly expenditures.

The public is primarily interested in the rendering of efficient, high-class service by every utility, and efficiency, progressiveness and permanency cannot be obtained, except by proper recognition and allowance, both of the fair value of the investment and fair return or profits thereon. Merely, "just" reward will not usually accomplish these results; the Constitution of the United States guarantees "nor shall private property be taken for private use without just compensation," but mere "just compensation" without something additional in the way of reward, or extra compensation, does not always insure satisfactory utility service and development. This is recognized by the courts and evidenced by the commissions in allowance by the latter of higher rates of return than the mere legal requirement. The restriction of reward or profit to that securable from most certain and conservative business ventures, or to the minimum that will be allowed by the Supreme Court in order to avoid confiscation, eliminates all incentive to risk and achievement which have always been the spurs to individual initiation, invention and enterprise, that are the boast of our modern civilization.

Public regulating bodies usually require a valuation of the physical property before undertaking rate-making. While this is natural and very often necessary in order to base conclusions upon actual figures, it is an interesting fact that some commissions have not required such valuation for rate-making purposes and have held that it is practicable to base rates upon information obtained from annual reports, examination of books and property, and a knowledge of the general condition of the utility being considered. In fact, mathematical exactness cannot be followed in working out the rates to be charged for services, even where a detailed valuation has been made; the valuation at best can only be used in determining an approximate amount of revenue which the utility is entitled to receive as a fair return upon its property.

We hear a great deal about rates being based upon the "cost-of-service" and "value-of-service" theory, but these bases of rates have to do mainly with apportioning the tariffs for services rendered, and have little to do, ordinarily, with the question of total revenue, which must be earned in order to yield the utility a fair return upon the value of its property. In fixing individual tariffs for each class of service, the maximum and minimum to be allowed are considered, but the total revenue from all classes of service at the different tariffs is what must be considered in connection with the value entitled to fair return.

"Is a rate unreasonable because it does not pay its full share of taxes, fixed charges, and dividends? \* \* \* \* \* If a carrier may raise all rates to a basis where each will bear its share of cost, including all costs, and no lower rate is reasonable, then it must follow that all rates are unreasonable which yield to the carrier a greater return than such cost. Under such theory what would be the rate on tea or silks, or high-priced horses, or delicate machines? Is there to be no classification of freight excepting upon the basis of cost of transportation plus insurance risk? If so the tariffs of every railroad in the United States must suffer a revolutionary change. In all classification consideration must be given to what may be termed public policy, the advantage to the community of having some kinds of freight carried at a less rate than other kinds. And this is the true meaning of the phrase 'what the traffic will bear.' It expresses the consideration that must be shown by the traffic manager to the need of the people for certain commodities. He accordingly imposes a higher rate upon what may be termed luxuries as compared with that imposed upon those articles for which there is a more universal demand. He also gives

consideration to the fact that the rate so imposed enters into the ultimate price to the consumer to but a small degree when the article is one of high value, and that those in the community who can afford to purchase such articles can well afford to pay a rate greater than that which could reasonably be imposed upon the general public for commodities of common use. In this sense what the traffic will bear and the value of the service are analogous. No one would claim that a carrier was violating its duty under the law in charging three times the rate upon oriental rugs that it imposed upon cotton. This would not be undue discrimination as between commodities, even though it costs no more to transport the rugs than it did the cotton, assuming both to be carried at the owner's risk, for the one does not compete with the other, and one may reasonably bear a higher rate than the other upon public grounds."<sup>1</sup>

Only general principles that should be adopted in determining the fair value of the property used, useful or reasonably necessary for the service being rendered, have been enunciated by the Supreme Court. Definite and determinate rules for valuing property have been established by some of the lower courts, as well as State commissions, and through the approval or disapproval of these decisions and rulings the Supreme Court may be said to have directly determined certain proper methods to be pursued in valuing public service property.

In the valuation of a utility property in Maine, there were referred to the Supreme Court of Maine, under a statute of that state, questions to be answered as a guide to the appraisers who were engaged in valuing the property of the water company for the purpose of acquisition by a water district. The instructions of the Court are so illuminating that they are briefly summarized as follows:

The Court held that the actual cost of the plant, with a proper allowance for depreciation, was competent evidence on the question of value, but was not conclusive.

That the earnings of the company might be considered, but would not furnish a proper test of value, unless found to have been reasonable.

That the quality of the water and service rendered and the

<sup>1</sup> Report and Order of the Interstate Commerce Commission, No. 1806, page 623; in the matter of the investigation and suspension of advances in rates for the transportation of coal by the Chesapeake & Ohio Railway Company, Baltimore & Ohio Railroad Company, Norfolk & Western Railway Company, the Kanawha & Michigan Railway Company, and their connections.

fitness of the plant to meet reasonable requirements were material upon the question of present value.

That the appraisers should regard the franchises of the company as entitling them to continue business as a going concern, but subject to all proper legal duties governing public service corporations.

That,  
"in fixing the value of the companies' franchises, the appraisers may give such regard as is demanded by ample and fair public policy to the past investment, risks and services of the companies, and to the reasonably just expectations which those who made the investment had in mind when so investing."<sup>1</sup>

That past misconduct or unfaithfulness on the part of the companies in performing their duties to the public, as by charging excessive rates, should not be considered on the question of the value of franchises.

That reproduction cost was properly to be considered, but that such cost was not conclusive because it left out of consideration the element of value as a completed structure, connected with buildings prepared for use, and the element that the company was a going concern, and that these latter elements were to be taken into consideration.

That,  
"in determining the amount to be added to structure value, in consideration of the fact that the system is a going concern, the appraisers should consider, among other things, the present efficiency of the system, the length of time necessary to construct the same *de novo*, the time and cost needed after construction to develop such new system to the level of the present one in respect to business and income, and the added net income and profits, if any, which by its acquirement as such going concern would accrue to the purchaser during the time required for such new construction for and such development of business and income."<sup>1</sup>

The two fundamental facts to be established in rate-making are the present value of the property being considered and the rate of return to be allowed thereon. To reach fair and equitable conclusions as to these facts to be established involves difficulties not alone because the facts must be fixed as a matter of judgment, but because the subject must be approached in fairness, equity and without prejudice to the conflicting interests involved.

<sup>1</sup> *Kennebec Water District vs. City of Waterville*, 54 Atl. (Me.) 6.

In attempting to follow the legal method of making an appraisal to arrive at the fair value for rate-fixing purposes, original investment or cost must usually give way to reproduction value, unless precluded by State laws or other contractual relations. It sometimes happens that rules and regulations fixed by legislatures and commissions or court decisions render futile the fixing of what is really fair present value, but that by no means prevents the ascertainment and presentation of the basis of fair value, although such basis may be ultimately discarded.

In rate-fixing, it must be constantly borne in mind that the problems to be solved are the fair revenue allowed a particular property on the basis of its value at the present time. This value cannot be ascertained merely by reference to its past history, even as to earnings or cost, unless such limits were fixed at the time of its creation. Whether earnings were so small in the past as not to have allowed ample return to the owners, or whether the earnings have been sufficiently great to permit payment of profits, as well as additions to and enlargements of the property itself, cannot be used to justify the use of any fictitious value or artificial rate of return in disregard of the real present value and fair return as between the owners and the rate payers. In attempting to ascertain the present value of the property, the appraiser must approach the question without bias of favoritism, considering only what a fair, business-like investment under existing circumstances, with normal conditions of construction and financing, would be required. The same fundamental principles must apply regardless of whether the property might be owned by an individual, a corporation, a municipality or the Federal Government, although the cost might be, and the rate of return allowed certainly would be, different with respect to the four different classes of owners indicated for purposes of illustration.

The valuation of public utilities for the purpose of rate-making requires the knowledge and skill of engineers, real estate appraisers, accountants and economists, financiers and lawyers. Otherwise, the proper importance of the many elements of the value going to make up the total fair value of the entire property will not be appreciated and duly recognized. The early attempts of accountants and lawyers to demonstrate to courts the value of property to be used as a basis for sale, condemnation, or rate-making resulted in frequent failure. Later, the



introduction of the engineer, who had had experience in operation as well as construction work, emphasized the relation of the physical to certain non-physical elements, but there was still lacking knowledge and recognition of many of the intangible elements, to demonstrate the causes and value of which were required the services of those expert in utility operation, in economics and finance.

"When \* \* \* appraisals first came to be used as a basis for rate regulation all, except engineers, regarded an appraisal as being somewhat analogous to a merchant's inventory of stock on hand—a very simple, though often laborious, process. Gradually it has become evident, even to non-technical men, that an appraisal for rate-making purposes is exceedingly technical and complex. When it is realized, also, that rate-making based on cost is even more technical than appraising a property, we shall have an end to the 'hot air' testimony of rate experts who are experts only in fixing rates as high 'as the traffic will bear.'

Appraisal and rate engineering has already become one of the many branches of engineering. The engineering specialist in this line should be primarily a logician, skilled in the use of language and in the science of reasoning. He should be thoroughly acquainted with the general principles of economics and particularly with the principles of engineering economics. He should be well informed as to the decisions of State and Federal rate-regulating commissions, as well as court decisions bearing on valuations and rates. He should be personally acquainted with specialists in many lines, so that he may select men competent to give any desired information. He should be thoroughly grounded, not only in the principles of accounting, but in the mechanical details of public utility accounting. He should be an incessant student of the new phases of his specialty and of unit costs of construction and operation. Executive ability is also essential to him, but need not be of as high an order as that required of one who is constantly directing large enterprises. It is needless, perhaps, to add that his character should be such that he would make an impartial judge. Obviously, no man can attain the ideal in this or in any other branch of engineering; but, at least, those who employ appraisal and rate engineers should aim to secure men who are idealists rather than opportunists, for this is not a profession where mere advocates will survive."<sup>1</sup>

In ascertaining the value of any property, new or old, the valuation of all of its physical or structural property is generally conceded as the first step proper to be taken. While agreement

<sup>1</sup> By H. P. Gillete, *Discussion on Physical Valuation of Railroads*, Proceedings of the American Society of Civil Engineers, Vol. XXXIX, No. 8.

may be had as to the inventory or list of items going to make up the total property, differences begin to arise as soon as assignment of value in dollars begins. This difference widens as percentages or estimated amounts are added for allowances, generally conceded necessary, to cover items too small to list separately, incidentals, omission due to inaccuracy, unrecognized contingencies of construction, engineering, administration expenses, cost of contractors' services and expenses, insurance, taxes, interest, cost of raising money, reward to the originators of the enterprise for services and expenditures before construction began, and other so-called overhead or intangible costs. Then there are the further differences as to the proper treatment of certain items such as real estate, the cost of developing the revenue as distinct from building the physical property, usually called "going value," the necessary allowances for working capital, and finally the application of depreciation, in order to obtain the so-called depreciated present value.

Even those advocates of the theory that only physical values, theoretically depreciated, should be considered in rate-making generally admit the fact that in addition to the actual net cost of the structural property there should be added certain allowances, more or less liberal, for all of those items mentioned above except going value. They may hold that real estate should be taken at its original cost, that working capital consists only of supplies and going value has no existence but, otherwise, they admit that after depreciation has been deducted from structural value, built upon such meager basis as here indicated, the remainder is the fair present value of any utility property.

**Law and Method.**—In considering value for purposes of rate-making, the subject may be approached from two distinct and, in some respects, diametrically opposed directions, one from a knowledge and intent to follow precisely the principles and precepts laid down in the law, based on court decisions, the other from an independent standpoint, regardless of court rulings but with a view to arriving at a fair and equitable value based on a knowledge of the practicable conditions under which construction and operation of public utilities may be carried out, an appreciation of the laws of political economy, a knowledge of finance and experience in valuation work. It is recognized by the legal profession that a decision may be technically correct but will work injustice. The courts versed in law rather than engineering have,

at times, possibly from lack of proper evidence, rendered decisions that make the law contrary to what it is possible and practicable to carry out in practice. On the other hand, determinations of value that are made without proper consideration of precedence and regard for previous decisions of the courts render the conclusions liable to be set aside in case appeal is made to the law. Therefore, the usual course pursued by those endeavoring to make physical facts and human possibilities conform to legal requirements is, with the use of knowledge obtained through the construction and operation of utility property, and having in mind legal precedence, to determine value upon principles of equity and justice, without violating the rules of law.

The general rule accepted by the investing public is that the present fair value of property is determined from a consideration of what it is fairly earning and what it may be fairly expected and allowed to earn in the future. This rule, by and far, applies to property regardless of whether it is owned by an individual, an industrial corporation, or a public utility. But, of course, tariffs charged for public utility service cannot be based on a value determined by capitalizing net earnings. Since the tariffs themselves determine the earnings, equity, common sense, and usually the courts indicate that the tariffs fixed must permit the utility property to earn a fair return upon its to-day's value, not upon what it may have cost originally or be prospectively worth in the future. Moreover, the tariffs, that is, the earnings, must be such as will maintain the fair value of the property, without tending to increase or depress said value, on the basis of capitalizing net earnings. In order to determine and fix the proper tariffs and earnings, the value of the property itself must first be established.

**Investment not Value.**—The theory that investment or original cost is value, is based upon the thought that the investor in a public utility should have his investment protected by the public, and receive a fair return thereon from the public, regardless of whether the value of his investment increases or decreases. The argument is that if from the beginning there is earned upon the money actually expended by the owner of a property what is now considered a fair return, rates fixed upon the cost basis are equitable, allowance being made for expenditures covering deficiencies usually occurring in the early days of a corporation's existence by recognizing such deficits as a part

of the investment or compensating for them in fixing the rate of return. This theory holds that the owners of property devoted to the public use, by reason of the special privileges and obligations, are entitled to only a reasonable return upon the cash expended, that is, upon the "cost," and should not be allowed to share either in any increment in land or other property values, or in profits larger than a "fair return," although perhaps the higher figures are the result of unusual foresight, business ability, or exceptional opportunity. The "original cost" theory is usually held to be applicable to those utilities which have prospered, or the property of which has largely increased in value so that the owners have had more than a so-called "fair return"—usually held to be from 6 to 8 per cent.—upon their investment. Risk to investment at the time of the original expenditure by reason of surrounding local conditions, uncertainty as to successful coördination of the physical property, development and improvements in the art, losses arising from competition, political agitation, unusual accidents, errors of managements, strikes, the time, energy, ability and initiative of the promoters, not usually paid for in money but in stock, are most difficult to understand, appreciate and evaluate years afterward when an enterprise has proven a success, and hence are almost always minimized and under-valued. Consequently the "original cost" theory does not appeal to the owners of successful utilities and has never proposed to be applied, even by its most ardent advocates, in fixing the rates to be paid a non-paying or abandoned proposition. The most liberal use of the theory has been to recognize certain deficits for an arbitrarily limited period only, immediately after a corporation starts business, which limited deficits are taken as the going value of the property; but this is in no sense a practical application throughout its corporate existence of the "cost" theory to an unsuccessful, unprofitable utility which may be serving the public just as faithfully as another more profitable corporation.

The attempt to apply the "original cost" theory under present-day regulation assumes that the corporation which has been in operation for years, although fixing its tariffs with the tacit and oft-times expressed approval of State or municipal authorities and supplying generally the requirements of the public, has been making undue and unfairly large profits. Such assumption as to profits is frequently entirely unwarranted and must be recog-

nized as an attempt to take from the present owners of a utility a part of its present value. Previous owners may have earned what are now considered too great profits, but as the public regulating bodies have not heretofore felt called upon to reduce these profits, although always having the power to do so, on what fair grounds can those former profits now fairly be readjusted to present-day standards, or a part of the earlier large earning, that may have been reinvested in the plant, claimed as the property of the public? Evidently the earlier profits were not considered exorbitant in those days by those best able to judge. Utility investments are now often made upon the understanding and agreement that the owners are to be allowed only a fair maximum return, regardless of the financial failure or success of the enterprise. Capital can be interested if the rate paid is high enough, but until recently there has been no understanding or notification that such return would be from 6 to 8 per cent. as a maximum for the successful corporations, with the unsuccessful ones standing their own losses.

While the courts recognize *bona fide* investment as one of the important elements to be given due weight in ascertaining values, they are practically in unanimous agreement that the only final basis upon which fair returns must be allowed is fair present value. Nevertheless, some individuals and public service commissions still maintain that cost, namely, the original, cost or cash, investment in the utility property is the only proper basis upon which to determine rates and allow returns. The attempt to base rates merely upon the original cost of investment results not only in unfairness to the present owners, but under many conditions will lead to absurd results, because value cannot be fixed without some regard to net earnings. The cost of a plant in the middle of the Sahara Desert, without ability to earn, would not fix its value. A recent appraisal disclosed the fact that an old type of dynamo, inefficient and out of date, was worth more by reason of the excessive amount of copper it contained, than the cost new of a modern machine capable of delivering the same output efficiently. Would the adherents of the investment theory argue that the public should pay a return, in addition to the higher operating costs for energy developed by the obsolete dynamo?

The investment or cost principle is eminently fair and beyond criticism, provided the investor originally places his money upon

that understanding, but it is unfair and improper to require an investor to accept such terms when he has put his money into an enterprise upon the understanding that he is taking the risk of loss or gain in his principal, with the concomitant gains or losses in earnings.

"Again upon the same point it should be said that those who engage in a public service cannot be put upon quite the same level as those who make mere investments. They are not like the depositors in a savings bank, whose right to draw out is limited to precisely what they have put in with its earnings. They are, on the contrary, engaged in a business, with the ordinary incidents of a business, with some of the hazards and some of the hopes of a business. To be successful they must be wise and prudent, thrifty and energetic. These virtues, if they have them, they impress upon the property, making it more valuable than it otherwise would have been. Is it to be said, that they can have no return for skill and good management? We do not think so."<sup>1</sup>

Public regulation is applying the investment theory to capital being added to corporations already under public control or to those enterprises which are being newly inaugurated without much criticism or charges of unfairness, because investment and present values are kept practically equal.

As a matter of fact, the repeated rulings of the various courts, including the Supreme Court of the United States, show quite clearly that original investment value is not the value of existing property. Without attempting to quote a long list of judicial decisions in this matter, some of which have been quoted in preceding pages, it may be pertinent to refer to the explicit language of the Supreme Court in a few instances, as for example in the case of the San Diego Water Company, where the Court said:

"The contention of the appellant in the present case is that in ascertaining what are just rates, the Court should take into consideration the cost of its plant. The basis of calculation suggested by the appellant is, however, defective in not requiring the real value of the property and the fair value in themselves of the services rendered to be taken into consideration. What the company is entitled to demand, in order that it may have just compensation, is a fair return upon the reasonable value of the property at the time it is being used for the public."<sup>2</sup>

<sup>1</sup> Brunswick & Topshaw Water District vs. Maine Water Co., 99 Maine 379.

<sup>2</sup> San Diego Land & Town Co. National City, 174 U. S. 757.

In the case of the Consolidated Gas Company the Court said:

"There must be a fair return upon the reasonable value of the property at the time it is being used for the public."<sup>1</sup>

In the more recent Minnesota rate cases the Supreme Court said:

"It is clear that in ascertaining the present value, we are not limited to the consideration of the actual investment. The property is held in private ownership and it is that property, and not the original cost of it, of which the owner may not be deprived without due process of law."<sup>2</sup>

In another railway case the Supreme Court said:

"Will it be said that the taxation must be based simply on the cost, when never was it held that the cost of the thing was the test of its value?"<sup>3</sup>

"We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public."<sup>4</sup>

Aside from the convincing language of the courts, it is very frequently found in practice impossible to ascertain from corporation records the investment value of the property. This condition results not always from intention to conceal such facts, but by reason of the earlier methods of keeping corporation records, and the fact that utilities, at least those of large size, are usually the result of sale, consolidation and amalgamation so that the records of the subsidiary companies would not pass to the existing corporation, and have been lost or destroyed in the ordinary course of business. Those advocates of the universal application of the investment theory apparently overlook this very important actual condition of affairs, namely, the inability to get at or produce records.

Under existing public regulation methods, a most satisfactory basis of valuation for a recently created property is the actual cost, excluding any unreasonable, extravagant or unfair expenditures. While on the one hand the public should not be required to pay a return upon injudicious or extravagant expendi-

<sup>1</sup> Wilcox et al vs. Consolidated Gas Co., 212 U. S. 19.

<sup>2</sup> Minnesota Rate Cases 230 U. S. 352.

<sup>3</sup> C. C. C. & St. L. Rwy. Co. vs. Backus, 154 U. S. 446.

<sup>4</sup> Smyth vs. Ames, 169 U. S. 546.

tures, on the other hand, all investments that have been honestly made in preparing to render the service, must be included in the value of the property. These costs relate not only to the structural property, but include all those expenditures for intangible items, or overhead charges, such as administration and organization expenses, cost of promotion, incidentals, engineering, interest and taxes during construction, etc., as well as going value, or the cost of developing the business and securing the revenue.

It would, of course, be unfair to apply the investment theory to certain utilities and apply another theory, which would relatively increase values, to the other utilities. For example, in the Interstate Commerce railway valuations now being made, there are available records of all more recent construction, so that investment cost can be ascertained, but with regard to much of the property no records are obtainable, so that some other method must be used in fixing values. It would evidently be inconsistent and unfair to apply different methods to the same property, or one method to a railroad which had records available and another method to a railroad which had no records. Therefore, some more uniformly applicable method than the investment theory must be used in determining values.

**Basis of Value.**—The highest courts have, beyond controversy, settled the fact that the owner of property devoted to, or reasonably necessary for, the service of the public is at least entitled to a fair return upon the fair value of such property. This conclusion of the courts is the extreme minimum allowable under the well-known clause of the Fourteenth Amendment to the Federal Constitution prohibiting confiscation of private property. Such conclusion does not necessarily preclude the principle that aside and in addition to return on property the owner may be entitled to remuneration for efficiency or the high class of service rendered, so that equitable rate-regulation should consider both property and service. The power to regulate rates is primarily based on the principle that justice is to be done both the owner of the property and the customers served thereby, but before fixing the tariffs for particular service rendered the consumers, there must be determined proper gross revenues which shall be sufficient to at least afford a fair return on the value of the property used, in addition to a reward for especial services—if any—and operating expenses, including de-



preciation. Consequently, even admitting minor differences in opinion as to the proper basis for rate-making, practically all agree that the value of the physical property used in the service is one of the most essential facts to be known before rate-making can proceed. Even though the character of service is excluded from consideration and it is held that rates are to be determined upon the cost of the service, there are instances where, even under such theory, rates cannot be made sufficiently high to furnish an adequate return upon the value of the property, because of the relatively large investment, high operating expense or by reason of competition or other unfavorable circumstances. Such cases, however, may be considered rather exceptional and abnormal, so that the methods of determining value and fixing rates, generally applicable, will not apply.

While the broad principles to be used in determining fair value are recognized, the detailed method of determining such value is more or less vague and the subject of much controversy. And, yet, uniformity of methods of valuation are really essential, if satisfactory relations between the utilities and the public are to be obtained and fairness and justice rendered to both.

As yet, public authorities, particularly the Supreme Court, have failed to indicate definite and complete rules to be applied in determining the fair value of utility property. Nevertheless, the higher courts have indicated the general principles which may be used as guides in determining the fair value to be established, in any particular case. They are:

*First.*—The original cost of the property of which the fair value is being determined.

*Second.*—The cost of reproducing new at the present time, with current prices, the existing property.

*Third.*—An estimate of the loss in value, the depreciation, if any, that has resulted to the property in rendering service.

*Fourth.*—The amount and market value of the stock and bonds outstanding, including both the original and subsequent issues.

*Fifth.*—The gross revenue and operating expenses.

*Sixth.*—The worth of the service rendered.

While all of the above elements mentioned by the courts are to be considered in determining value in any given case, the relative weight and importance of any given element must be determined by the authority fixing value. These views are in

accordance with court rulings, as clearly indicated in the National Water-works Company case, where the Court said:

"We are not satisfied that either method, by itself, will show that which, under all circumstances, can be adjudged 'the fair and equitable value.' Capitalization of the earnings will not, because that implies a continuance of earnings, and a continuance of earnings rests upon a franchise to operate the water-works. The original cost of the construction cannot control, for 'original cost' and 'present value' are not equivalent terms. Nor would the mere cost of reproducing the water-works plant be a fair test, because that does not take into account the value which flows from the established connections between the pipes and the buildings of the city. It is obvious that the mere cost of purchasing the land, constructing the buildings, putting in the machinery, and laying the pipes in the streets—in other words, the cost of reproduction—does not give the value of the property as it is to-day. A completed system of water-works, such as the company has, without a single connection between the pipes in the streets and the buildings of the city, would be a property of much less value than that system connected, as it is, with so many buildings, and earning, in consequence thereof, the money which it does earn. The fact that it is a system in operation, not only with a capacity to supply the city, but actually supplying many buildings in the city—not only with a capacity to earn, but actually earning—makes it true that 'the fair and equitable value' is something in excess of the cost of reproduction. The fact that the company does not own the connections between the pipes in the streets and the buildings—such connection being the property of the individual property owners—does not mitigate against the proposition stated, for who would care to buy, or at least give a large price for, a water-works system without a single connection between the pipes in the streets and the buildings adjacent? Such a system would be a dead structure, rather than a living and going business. The additional value created by the fact of many connections with buildings, with actual supply and actual earnings, is not represented by the mere cost of making such connections. Such connections are not compulsory, but depend upon the will of the property owners, and are secured only by efforts on the part of the owners of the water-works, and inducements held out therefor. The city, by this purchase, steps into possession of a water-works plant—not merely a completed system for bringing water to the city, and distributing it through pipes placed in the streets, but a system already earning a large income by virtue of having secured connections between the pipes in the streets and a multitude of private buildings. It steps into possession of a property which not only has the ability to earn, but is in fact earning. It should

pay, therefore, not merely the value of a system which might be made to earn, but that of a system which does earn."<sup>1</sup>

Some discussion of the merits and weight of the several elements to be considered, in accordance with the instructions of the courts, has been had in preceding pages, others will be discussed more fully hereafter, but it should be here recognized that value is the result of judgment and cannot be mathematically deduced from a consideration of any one or all of the six elements specified above. The six elements of cost may be considered as pedestals supporting the platform on which rests the determined value. Which one of the pedestals, or whether more than one, shall carry the principal part of the weight in arriving at the value fixed, may be determined in each case, but as a rule the second and third elements named are primarily, and the fifth and sixth elements secondarily of greatest importance in every valuation. The reasons why original cost is not of primary importance in fixing the value of utility property that was created before the present era of public service regulation, have already been discussed in preceding pages. The value of outstanding stocks and bonds, or other securities, cannot usually be urged or accepted as the proper basis of fixing present value for the reason that some utilities have not issued securities equal in value to their property, while others have issued too large amounts and have outstanding "watered" securities.

The Honorable F. W. Stevens, formerly chairman of the Public Service Commission of New York, Second District, very clearly indicates the use to be made of the word "value" in connection with the appraisals of the property made for rate determinations:

"A thing may be valuable without any reference to money, but whenever we speak of value in the economic sense, we express it in terms of money, and value is nothing but a ratio, an expression of a relation between money and the article valued. Now, what determines the ratio; what determines the relation? It is nothing more nor less than a mental condition. It is a state of mind with reference to the article, and not an attribute or quality of the article itself. If you happen to own a fine residence, upon a fine street, with some vacant lots near you which you consider to be worth any given sum of money, we will say, for example, \$10,000, and suddenly upon one side of you there is put up an Italian boarding house, and upon the other

<sup>1</sup> National Water-works Co. vs. Kansas City, 62 Fed. 865.

side a drinking saloon, something has happened to the value of your property. What is it? The property is there just the same; there is no change in the property itself. The house is just as good, the lot is just as good. But what you could sell for \$10,000 before you cannot now sell for \$5,000, we will assume. The surrounding circumstances are such as to change the estimation of people who would want to buy such a piece of property regarding it. Before they would rather have the property than \$10,000. Now they would rather have the \$10,000 than the property, and will part with only \$5,000, showing that the value is nothing but a relation between money and the article valued, and that relation depends upon the state of men's minds. That may seem rather metaphysical, and rather theoretical, but it is the fundamental principle which you must grasp if you are going to solve this question of value."<sup>1</sup>

**Present Value.**—In determining the value of utility property, not only must the quality of fairness, as between the owners and the public, be considered, but the fair value at the date of the inquiry, that is, present fair value must be established. "Present" value means the "here and now" value of the property used, useful, or reasonably required for the service being rendered. Fair present value is the result of a judgment formed from the consideration of the "facts, figures and law" involved in each particular case.

"What the company is entitled to demand, in order that it may have just compensation, is a fair return upon the reasonable value of the property at the time it is being used for the public."<sup>2</sup>

"In estimating the value of the property, we must take, not what was its value in the past, nor what it cost, nor what it would cost to duplicate it, nor its probable future value, but the estimate must be based on its present value."<sup>3</sup>

"Under the authorities, in fixing the rate to be charged for the 'public service' by private corporations, two elements of calculation are of fundamental importance: What is the true present value of the property embarked in the enterprise? and what, in view of the risks of business, is a fair, annual percentage of return thereon?"<sup>4</sup>

"It is impossible to observe this continued use of the present tense in these decisions of the highest court, without feeling that the actual

<sup>1</sup> Address delivered before the American Electric Railway Association at Atlantic City, Oct. 14, 1914.

<sup>2</sup> *San Diego Land & Town Company vs. National City*, 174 U. S. 575.

<sup>3</sup> *Matthews vs. Board of Corp. Com'rs*, 106 Fed. 7, 9.

<sup>4</sup> *Consolidated Gas Co. vs. Mayer*, 146 Fed. 150, 156.

or reproductive value at the time of the inquiry is the first and most important figure to be ascertained.”<sup>1</sup>

This doctrine, as thus announced, was sustained in the famous New York City gas case by the United States Supreme Court in the following plain statement:

“There must be a fair return upon the reasonable value of the property at the time it is being used for the public.”<sup>2</sup>

In *Cotting vs. Kansas City Stock Yards Co.* there is a review of all the prior cases decided by that court involving the fixing of rates by legislative enactment and reaffirmation of its previous position.

“It (the Supreme Court) has declared that the present value of the property is the basis by which the test of reasonableness is to be determined, although the actual cost is to be considered, and that the value of the services rendered to each individual is also to be considered.”<sup>3</sup>

In *Cumberland Tel. & Tel. Co. vs. City of Louisville*, 187 Fed. 637, on page 642, the rule is stated as follows:

“It would seem clear from the decisions that the most material question in such cases is that of the reasonable value of the property ‘at the time it is being used for the public’—that is to say, the time at which the question arises—it being upon the reasonable valuation at that time that the company is entitled to earn a fair return. \* \* \* The value of a plant may depend upon good fortune, upon good management, or upon fortuitous circumstances, but in every event the reasonable value of the property ‘at the time it is used for the public’ is the value we are to ascertain for the purposes of this controversy.”

“The property is held in private ownership, and it is that property, and not the original cost of it, of which the owners may not be deprived, without due process of law.”<sup>4</sup>

In *Louisville & N. R. Co. vs. Railroad Commission*, 196 Fed. 800, an objection was made, because, in fixing the value of the plant, present prices were used instead of those prevailing at the time the plant was constructed. In answer to this objection, the Court, at page 821, says:

“One of the objections of the respondents is that the estimates were based on the prices of 1907 when they were made, and that they were

<sup>1</sup> *Consolidated Gas Co. vs. Wilcox*, 157 Fed. 849.

<sup>2</sup> *Wilcox vs. Consolidated Gas Co.*, 212 U. S. 19, 41.

<sup>3</sup> *Cotting vs. Kansas City Stock Yards, etc.*, 183 U. S. 91.

<sup>4</sup> *Simpson vs. Shepard*, 230 U. S. 352.

then unusually high. This is disposed of by the point that present values are required to be taken and used in determining present and prospective rates."

The recent case of *Des Moines Water Co. vs. City of Des Moines*, 192 Fed. 193, is a thoroughly considered case, both by the master and by the Court which affirmed the master's decision. In that case, at page 196, is the following statement:

"The question is not what it (the plant) cost, although such evidence is admissible as having a bearing. The question is not what the plant some day may be worth, although evidence with reference thereto may be considered as having a bearing. The question is: What is the value of the plant to-day? There must be a reasonable rate of interest or dividends allowed on the value of the plant."

Eminent authorities in the line of engineering, law and economics differ in the valuation of utility properties, as to whether "present cost," as enunciated by the Court, shall be taken to mean the cost new or whether that cost must be reduced by an estimated amount of accruing depreciation not yet fully accrued. The lower courts and commissions have given conflicting opinions on this point and the superior court has rendered somewhat indefinite and contradictory decisions on this particular question. It is difficult to understand why the term used by the Supreme Court "present cost" should be taken by anyone to mean present cost less depreciation. It should be noted that the Supreme Court avoids saying that accruing depreciated cost is the present value, such meaning simply being a contortion of the statement of the decision in the *Smyth vs. Ames* case.

In a rate case, the question to be determined is the present—meaning now—value of the property, being used for the service of the public. This value is to be fixed by the exercise of judgment, from a consideration of the several evidences of cost, namely, the original investment, the reproduction cost new, and both of these reduced by the cost of discarded and no longer useful apparatus to get present cost, as well as a consideration of the market value of stocks and bonds, together with expenditures for improvements and maintenance.

Where records of investment are not available reproduction cost becomes all-important in determining the value of the property serving the public, which present value exists regardless of the credit of the corporation, the state of its assets, or whether the

corporation obtained the property as the result of the sale of bonds, stocks, notes, by gift or from accumulations of surplus.

Rates cannot be based upon earnings previous to the inauguration of public regulation of such earnings. If attempt were made to consider past earnings in determining value of property, should the consideration include earnings for one, two, five or ten years, and if so, why not for a longer period, say from the origin of the company. If the earnings should be found to be more than a fair return upon the value of the property, in addition to a proper sum to cover all depreciation, why should not such excess be also deducted from cost new, in determining present value, the same as it is proposed to deduct the amount of a theoretically computed reserve fund. Such procedure, while logical, would not be reasonable or justified by the courts, for no corporation can retroactively be required to account for its surplus or its deficiency previous to the initiation of public regulation.

"Should the Government to-day take note of that surplus for the purpose either of so reducing the rates of the company that no earnings can be made upon this much of the property, or with a view in some sense to turn that surplus back again into the hand of the public?

"During all this period the excess has gone into the property, which has gradually become more valuable, and this increased value has reflected itself in the market price of the securities of that company. It is impossible to restore what has been improperly taken in the way of excessive rates to those persons from whom it has been received. The Government, under those circumstances, cannot lay hold on this surplus as a fund held in trust for the public.

"This case strongly illustrates the fact that if any Government tribunal is to do justice between the railway and the public, if it is to feel any confidence in the correctness of its conclusions, its supervisions must be continuous and not spasmodic. There must be some point of departure and from that point the knowledge of the Government must be accurate and complete. After earnings have once been 'capitalized' and benefits have been 'conferred,' when the various independent organizations have been perfected, it is impossible to either know or to undo."<sup>1</sup>

The Supreme Court, of the State of Massachusetts, has definitely held—contrary to the order of the Gas and Electric Light Commissioners—that a utility is entitled to capitalize proper expenditures for plant additions, regardless of and aside

<sup>1</sup> Commissioner Prouty of the Interstate Commerce Commission in *Spokane vs. Northern Pacific Railway Company*, 15 I. C. C. R. 376, 415, Feb. 9, 1909.

from what profits it may have earned. The Fall River Gas Works Company, after paying dividends at the rate of 10 or 12 per cent. per annum, had remaining as profits an amount exceeding *bona fide* obligations incurred in making additions to plant and property of \$200,000, for which notes had been issued, plus \$40,000 for proposed equipment expenditures. The corporation, instead of applying its profits to the discharge of these obligations, distributed its profits among its stockholders in the form of two extra dividends of 15 and 20 per cent. respectively. Afterward the company sought the Commission's approval of the issuance of 1,150 shares of additional capital stock at the price of \$225 per share, the proceeds to be used to meet the \$240,000 of notes and proposed expenditures. The Commissioners refused to authorize the issuance of stock on the grounds that the profits of the company were sufficient to take up the notes without increasing the capital account; the Commission did not question the propriety or reasonable necessity of the plant additions, or that the amount expended represented their cost and real value. The Court, in overruling the Commission's refusal to authorize the issuance of additional capital, says:

"When the corporation has performed all its duties, and by its fortunate situation, good management, or any lawful conduct has remaining a surplus of earnings, it has the right to distribute this surplus among its stockholders in dividends. As between the public and the corporation the earnings belong to the corporation. In performing its full duty to the public and others it has done what it was chartered to do, and is entitled to the profits of the business for which it was chartered. If there be any reserved power in the charter whereby the profits can be reduced or the charter revoked, of course, that power may be invoked if it appear that the charter is too favorable to the corporation. And in the case of a gas company the profits may be reduced by an order lowering the price of gas, if such order seems just and reasonable. (R.L., c. 121, § 34.) The relations between a public-service corporation and the public to serve whom it is chartered are not that of a partnership, but rather that of independent contracting parties. The public may demand proper service, and with that demand the corporation must comply. The company may demand fair compensation for this service, and with that demand the public should comply. The corporation can have no share in the benefit to the public, nor can the public have any share in the net profits available for dividends.

"Upon the question whether there shall be an issue of additional stock to meet liabilities incurred in increasing the efficiency or value of



the plant, the amount of undivided profits on hand at the time the liabilities were incurred or the expenditures made which thereafterward and before the application to the Board have been lawfully distributed as dividends is entirely immaterial. We see nothing to take this case out of the general rule.

"Nor is this proposed increase a violation of the statutory provision against the issue of a stock dividend. It certainly is not in form such an issue. Nor is it in substance. The sum raised goes to increase the value of the plant for the purposes of the business for which the petitioner was incorporated; and that is none the less true, even if these expenses could have been paid by the funds since lawfully distributed as dividends.

"It follows that in the decision to dismiss the petition upon the grounds stated in the record there was error in law."<sup>1</sup>

Property kept in first-class operating condition is entitled to a fair return on the full value of that property, without deduction for theoretical, accruing depreciation, which does not yet call for any renewal of parts. The fact that the property is rendering 100 per cent. service must be determined by inspection and not from a consideration of life tables.

The consumer is only interested in the service rendered and is not concerned as to just when certain parts of the plant must be replaced from one cause or another. The present value of the plant, as far as the consumer goes, is its present value to render the requisite service, without regard to the amount of cash or reserve funds on hand or the expectation of life of the several parts of the physical property, as computed by various methods and differing experts.

It is not claimed that the cost new of all the property that may be owned and inventoried is the proper value to be taken as the basis for determining rates. This is illustrated, for example, by the fact that claim is made only for scrap or salvage value of apparatus, held simply awaiting a favorable opportunity of sale, no longer used in service to the public, having been displaced by new apparatus. It is admitted if the value of superseded, obsolete, inadequate or not actually used property is included in the inventory at cost new that such value must be reduced by the full amount of depreciation necessary to represent such actual deterioration. Depreciation of the class here referred to can be properly determined only by inspection of the physical property,

<sup>1</sup> Fall River Gas Works Co. vs. Board of Gas and Electric Light Commissioners, 214 Mass. 529.

and in most utilities a deduction on account of such depreciation will amount to but a few per cent. of the cost new. With deduction having been made for such deterioration as is shown to exist as the result of inspection, the full remainder of the cost new represents present value. In this manner only is the cost new of all property inventoried and fairly appraised, to be reduced for the purpose of fixing fair returns and determining rates.

**Court Decisions.**—It is conceded that the decisions of some authorities hold that, in determining the value of property upon which to fix rates of returns, deduction from cost new, on the basis of a theoretical computation should be taken into account, but this is not the ruling of the United States Supreme Court.

In considering any decision of the Supreme Court, it must be borne in mind that the Court is passing on the particular case in question and any conclusions reached are based upon the peculiar circumstances surrounding that particular property. Consequently, too much importance should not be attached to the decision of the Supreme Court in some individual case when attempting to arrive at the fundamental principles which may be applied generally. While it is true that the last word in any particular instance rests with the Supreme Court, and that such Court is given to following precedent, nevertheless, it cannot be presumed that the Court will seek to perpetuate what may be demonstrated to be a wrong, merely to avoid reversing itself.

No question can be regarded as finally settled until settled equitably. Because, in the Consolidated Gas case, the Supreme Court held that to maintain a pressure of  $2\frac{1}{2}$  in. (0.09 lb. per square inch) in all gas pipes in the distributing system in New York City, "the mains and other pipes would have to be strengthened" is so contrary to fact and what even the commonest laborer employed about gas works knows to be the fact, that eventually the Supreme Court must reverse itself on this conclusion, rather than that the laws of nature are to be revised.

**Minnesota Rate Cases.**—In the same way, the statement of Judge Hughes in the Minnesota rate cases to the effect that

"We also think it was an error to add to the amount taken as the present value of the lands, the further sums calculated on that value,

which are embraced in the items of 'engineering,' 'superintendence,' 'legal expenses,' 'contingencies' and 'interest during construction,'"

and the further statement in the same decision,

"It is impossible to assume, in making a judicial finding of what it would cost to acquire the property that the company would be compelled to pay more than its fair market value. It is equipped with the governmental power of eminent domain,"

are contrary to common knowledge and experience. Any apparent conclusion that a railroad could purchase real estate by reason of its right of eminent domain at the value of adjoining land is so contrary to common knowledge and experience in railway construction that the establishment of such principles could not be accepted even if attempted by the Supreme Court. If, in the Minnesota rate cases, evidence was improperly presented as to the necessity for allowing engineering and other incidental expenses, or the fact that real estate cannot be purchased at the value of adjoining land, was not established in the record, that may have been sufficient grounds for the refusal of the Supreme Court to accept the values claimed by the railroads, but any deficiency in the evidence necessary to prove the proper basis of value upon which to fix rates cannot be assumed as conclusive and a safe premise on which to base a succeeding case in which it may be presumed the Court will have full and proper information on these subjects.

It is more than likely that what the Court in the Minnesota rate cases was pointing out as error in the values claimed for rights-of-way was that the valuation had been made upon the wrong theory, which was an estimate in *excess* of the market value of contiguous and similar property increased by the multiplier, three. That upon *such* erroneous basis or amount, further sums could not be fairly added for "engineering, superintendence, legal expenses, contingencies and interest during construction." There is no warrant for supposing that the Court would have condemned a method which started with the fair market value of contiguous property and increased that amount by the proper multiplier. It would be absurd to assume that the Court intended to imply that the railroad, at present, was only entitled to such value for its right-of-way as that right-of-way had cost when the railroad was built perhaps half a century ago, or what it would cost if the territory had never been served by a railroad.

**Consolidated Gas Case.**—The particular question with reference to whether the amount of depreciation of physical property was to be determined from actual inspection or from calculations based on estimated life tables was squarely involved in the Consolidated Gas case and definitely passed upon by the master appointed to take the testimony in that celebrated case. The total valuation of that property was some \$56,000,000. It was shown that an expenditure of \$604,988 for "repairs" (slightly over 1 per cent.) would make the plant as good as new, and this is the only sum that was deducted from the reproduction cost new, notwithstanding, it was most vigorously contended by the plaintiff in that case that a further deduction of millions of dollars should be made for theoretical or "accrued" depreciation. The master says, regarding the testimony of the expert for the plaintiff, Mr. Marks, and for the defendant, Mr. Mayer, that

"Mr. Marks did not particularly regard the extent of depreciation actually existing, but assumed a theoretical deterioration of the supposed life of the plant. He testified:

'Depreciation results from several causes. The most ordinary one is decay or wear and tear, as observed. There is another factor which is inadequacy, owing to the increase of the business. There is also another cause of depreciation, obsolescence, which is due to the changes in the arts and in the methods and in the general growth of scientific knowledge; if a works built at a certain period is kept in perfect repair, meaning by that, always restored to their original condition, there remains, assuming that, a depreciation due to both obsolescence and to inadequacy.'

"In this view he made estimates on the theory of the cost of final replacement to cover such inadequacy or obsolescence, ranging from 25 per cent. to 60 per cent. and based on a supposed life of 120 years for the plant. The discrepancy between his valuations and those of Mr. Mayer is largely due to their different methods of estimating depreciation. He said:

'Mr. Mayer does not differ largely from my own figures of structural cost. You may say for all ordinary purposes they coincide, with the exception of the gas holders and even there they do not differ largely. It is the question of depreciation entirely.'

"As will hereafter appear, it is proper in the administration of a manufacturing plant to take depreciation of the character above described into account and provide against it by setting aside a reserve fund from current earnings. For the purpose of determining present

value, however, particularly on the basis of cost of reproduction, the method followed by Mr. Marks does not commend itself. It appears from the record, without substantial dispute, that while certain of the plants and apparatus may not be in perfect repair, they are as a whole in efficient operating condition, and that a large proportion of their capacity is represented by the latest pattern of water gas apparatus installed within the last few years. \* \* \*

"The fact thus being that the plants are in good order and operating efficiently, it does not appear reasonable, for the purposes of this case, to charge them with a theoretical deficiency so great, as, if actually existing, would make their successful operation a practical impossibility. An estimate of depreciation like those of Mr. Edgerton and Mr. Mayer, based on a detailed examination of the property as it stands to-day, affords in my opinion a more fair and practicable method to be followed in determining its value."<sup>1</sup>

The master, in this case, in dealing with the alleged necessity for a reserve fund to provide for "final renewals" when the life of the apparatus should expire, says:

"Of course, the requirement of such 'final renewal' provision affects in no way the present value or efficiency of the plants of the company as operating concerns, except to the extent of the repairs (\$604,988 above mentioned), which would be required to make the operating plant as good as new."<sup>1</sup>

From the above, which is probably as full an exposition of the proper basis for estimating depreciation as was ever passed by the Supreme Court, several important points would seem to be made clear:

(a) Depreciation should be determined by personal inspection rather than by theoretical estimate.

(b) Property that is in good order and operating efficiently, although not new, need not necessarily be depreciated, at least in rate cases.

The decision of the Supreme Court in the Consolidated Gas case has not been given due consideration in the matter of depreciation as against the same court's decision in the Knoxville Water case, although both decisions were rendered the same day. In the writer's opinion there is no contradiction between these decisions as to the meaning of "fair value" or method of allowing for depreciation if the decisions are fairly interpreted.

<sup>1</sup> Master's Report, Consolidated Gas Co. of New York. Filed June 24, 1907, page 137.

**Fair Rate.**—The fair return that should be allowed will vary under different circumstances and localities and must be determined for the particular case being considered. The fixing of a fair return is an entirely separate and distinct question from determining the fair value of the property used. In fairness, one cannot be made low and offset by making the other high, and *vice versa*. Consequently, no attempt is made herein to name all the elements to be considered, but rather merely to discuss what may be some of the general principles for arriving at and fixing a fair rate of return, bearing in mind the fact that the rate of return is entirely independent of and distinct from the fair value of the property.

The now generally accepted view prevails that the utility is not only entitled to have the fair present value of its property recognized, but the return allowed upon the value must also be sufficient to sustain and maintain that value.

“But as it is firmly established that it is within the scope of judicial power, and a part of judicial duty, to inquire whether rates so established (by Municipal Ordinance) operate to deprive the owner of his property without just compensation, it seems to me that it logically follows that if the Court finds from the evidence produced that they are manifestly unreasonable, it is its duty to adjudge and to annul them, for it is plain that if they are manifestly unreasonable, they cannot be just. In the solution of that problem many considerations center; among them, the amount of money actually invested. But that is by no means, of itself, controlling, even where the property was at the time fairly worth what it cost. If it has since acquired any value, those who invest their money in it, like others who invest their money in any other kind of property, are fully entitled to the benefit of the increased value. If, on the other hand, the property has decreased in value, it is but right that those who invested their money in it, and took the chance of the increase of value, should bear the burden of the decrease. In my judgment, it is the actual value of the property at the time the rates are fixed that should form the basis upon which to compute just rates, having at the same time due regard to the rights of the public, and to the cost and maintenance of the plant and its depreciation by reason of wear and tear.”<sup>1</sup>

The more usual view of the courts as to the controlling principle to guide in fixing rates has been clearly set out in the Spring Valley Water Works decision as follows:

<sup>1</sup> San Diego Land & Town Co. vs. City of National City, 74 Fed. Rep. 83.

"It is not a matter of guess work or any arbitrary fixing of rates without reference to the rights of the water company or the public. When the constitution provides for the fixing of rates or compensation, it means reasonable rates and just compensation."<sup>1</sup>

The above view has not been uniformly held. Although Judge Brewer, in a railroad case, makes the following startling statement, his conclusion is not in accord with the later rulings of the courts as was shown under "Development of Law," page 7:

"Whether by reducing the compensation to a minimum railroad enterprises shall be discouraged, or, enlarging, encouraged, is a matter for legislation, and not judicial determination. Take a kindred matter. It is within the power of the Legislature to prescribe the rate of interest, and to punish by severe penalties the exaction of larger than the legal rate. What that legal rate shall be is not for the courts, but for the Legislature, to determine. Suppose the Legislature of Iowa should reduce the legal rate of interest to 1 per cent., although such Legislature would prevent capital from coming into the State, would the courts have power to declare the law unconstitutional? In like manner, the rulings of the Supreme Court imply that the Legislature may reduce railroad rates until only a minimum of compensation is secured to the owner. The rule, therefore, to be laid down is this: that where the proposed rates will give some compensation, however small, to the owners of the railroad property, the courts have no power to interfere."<sup>2</sup>

A fair return upon utility property may equitably be taken to mean an amount sufficient to cover ordinary interest and, in addition, some reward or profit based on the local conditions and risks incidental to the requirements of invested capital, under the particular circumstances in question. This fair return is over and above all expenditures for service, the expenses of conducting the business and the costs of maintaining the property in first-class operating condition. Of course, operating expenses include expenditures for fuel, oil, water, wages, salaries, taxes, normal wear and tear, and maintenance, as well as renewals and replacements, whether necessitated by exhaustion of physical elements, inadequacy, obsolescence, or other functional depreciation. In addition, in the case of a limited franchise, or other similar limiting circumstance, the annual operating expenses must include an amount sufficient to provide an amortization

<sup>1</sup> *Spring Valley Water Works vs. the City & County of San Francisco*, 82 Cal. 306.

<sup>2</sup> *Chicago, etc., R. R. Co. vs. Dey*, 35 Fed. Rep. 866.

fund that will return to the owner the full value of his property at the expiration of its term of service.

In considering the fair return to be allowed investors of public utilities, the best present-day practice bases such return upon the fair present value of the property. This fair present value has too commonly in the past been taken to include but little more than the physical, structural property. Recent decisions of regulating bodies and the reviews of these matters by the courts, recognize that a return must be allowed not only on the value of the physical plant, but also upon that expenditure which may fairly be considered necessary for developing the revenue and attaching the business to the plant.

Surprising as it may seem, the authorities have held in a number of cases that the value of the property and the rate of return are interdependent, but any such views are erroneous. Mr. R. H. Whitten, largely voicing the views of the Public Service Commission, First District, State of New York, says:

"Value in a rate case is the amount on which the fair return should be allowed, in order to adequately compensate the investor. The essential thing is not the value alone or the rate of return alone, but the net income, which is the product of the two. So long as the net income remains unchanged it is immaterial, so far as the justice of the result is concerned, whether cost of creating a paying business is taken care of by increasing fair value and reducing fair rate of return or by increasing fair rate of return and reducing fair value. A reasonable net income is the fundamental requirement."<sup>1</sup>

Mr. Whitten speaks from the viewpoint of the public without due consideration of the effect of such basis of fixing rates from the investor's standpoint. Mr. Whitten's statement is true in the long run only as regards the consumer. A sudden change in the prevailing rates for money, as has been witnessed recently by the outbreaking of the European war, entitles a utility immediately, without time for a revaluation, to a larger rate of return on the value of its property, which therefore must be at all times the fair and proper value. The universal tendency is to gradually reduce the rate of return as public utility properties develop, become more stable and the cities in which they are located increase in population and importance. If then, the value of the property has been fixed unfairly low, with the thought

<sup>1</sup> Valuation of Public Service Corporations, page 567.



that the net income allowed is the same, because of a somewhat higher rate of return, the reduction in the rate of return to what, in the future, may be considered fair by some other regulating body, or enforced as a minimum by a court in order to prevent confiscation, will yield an unfairly low income as compared with what that income would have been had the full, fair value of the property always been recognized and allowed.

Along the same line of erroneous reasoning, the Public Service Commission, First District, State of New York, in substantiating the value allowed in the Queens Borough case says:

"The data used to determine existing depreciation (and therefrom the present value of the property) have been used to fix the amount that should annually be set aside, out of earnings, to meet accruing depreciation. If the above estimate is too low, then the annual payment is too low. But if the above estimate is too low, then the present value is too high and the amount to be accepted as a fair return on 'fair value' should be reduced."<sup>1</sup>

Failure to appreciate the absolute separation of rate of return from fair value fails to afford equity to the investor. The proper rate of return for a given case should be determined not only from the consideration of the local rate for money and risk of the particular enterprise under consideration, but there should also be included an allowance that will encourage efficiency and enterprise.

The remarks of Edward M. Bassett, then a member of the New York Public Service Commission, First District, in an address delivered by him on Dec. 10, 1910, before the Brooklyn Company Section of the National Electric Light Association, at its regular monthly meeting, are very much in point:

"Efficiency in a public-utility corporation redounds not only to the benefit of the public, but should redound to the benefit of the corporation itself. The saving that comes from thrift, the greater earning capacity that comes from ingenuity and faithfulness, is properly divided between the public and the corporation itself, not forgetting the payment of good wages and the making of permanent and promising positions for those that contribute to that result. I for one am of the opinion that public regulation should incite and increase and encourage private initiative, thrift, economy, better results for a certain amount of work, more electricity for a certain number of pounds of coal, and that

<sup>1</sup> In the matter of the Gas & Electric rates charged by the Queens Borough Gas & Electric Company, Vol. II, P. S. Comm. Reports, 1st Dist., Sept. 1909-Dec. 1911, page 562.

that efficiency should not entirely or anywhere near entirely be taken advantage of by the public, but the corporation that can produce results is entitled to a large measure of the benefits of its own efficiency and progress.

"Public regulation will in no sense be a success until that principle is largely recognized, because you cannot make all companies the same. If you try to make all the same it will be pressing down the capacity to the level of the poorest rather than raising up, or the endeavor to raise the capacity of all to that of the highest, and profit for the investor, payment of good wages, and the ability to pay good wages to the workman, must be encouraged by the State, representing all the people."

That the highest authorities recognize the necessity for varying the rate of return—independently of the value of the property—is shown by the decision of the United States Circuit Court in the Minnesota Rate Cases in these words:

"The legal rate of interest on a debt in Minnesota, in the absence of contract, is 6 per cent., and by contract it may be 10 per cent. per annum. Rev. Laws Minn., 1905, Sec. 2733. Rational investments in agriculture, manufacturing, mercantile, and other industrial pursuits, and even well-secured loans, yield returns in Minnesota corresponding with these lawful rates.

"It is an axiom in economics that the greater the risk the greater must the returns be upon invested capital, and the conclusion is irresistible that a net return of 7 per cent. per annum upon the respective values of the properties of these companies in Minnesota devoted to transportation is not more than the fair return to which they are entitled under the Constitution of the United States."<sup>1</sup>

One of the latest and clearest opinions of any State court, bearing on this subject, is that rendered in the Passaic case, where a decision by the Public Utility Commission of New Jersey was appealed by the corporation to the Supreme Court.

"To induce investment and continuance of capital there must be some hope of gain commensurate with that realizable in other business. The mere assurance that the investment will not be confiscated would not suffice."<sup>2</sup>

**Efficiency in Operation and Utilization.**—The value of service rendered to the public by a given physical plant is determined not alone by the actual cost of that plant, but as much or more by two other factors. These are:

<sup>1</sup> *Shepard vs. Northern Pacific Railway Co. et al*, 184 Fed. 816.

<sup>2</sup> *Public Service Gas Co. vs. Board of Public Utility Commission et al*, 87 Atlantic 655.

- (a) Efficiency in operation.
- (b) The degree of effective utilization.

The many questions involved in ascertaining the fair value of the property has resulted in many instances in failure to properly analyze and determine whether or not the operating expenses are such as may properly be allowed, or whether they indicate efficiency and a high degree of business acumen. It is rather common practice to assume that the operating expenses in any given instance are normal, possibly making some slight corrections by additions or deductions for items not properly charged and then accepting such operating expenses as proper and unworthy of further consideration. The acceptance of any such principle, while not affecting the value of the property being appraised, does not recognize the difference between inefficient and the most advantageous management. In fact, such treatment of operating expenses puts a premium on indolence, extravagance, and inefficient management, because there is no inducement to reduce expenses to a minimum, or to seek improved methods that will make "two blades of grass grow where one grew before." Efficiency in operation should be rewarded by allowing a rate of return higher than normal, but that is distinct and apart from foresight or sagacity that obtains for utility property advantageous conditions, gifts of real estate, privileges or rights that to-day cannot be duplicated, all of which represent value in the markets of the world, and hence are a part of the fair value on which rates are to be based. Therefore, while the term valuation is often taken to relate exclusively to property, tangible or intangible, which is attained through the expenditure of money, fair values should recognize not only the value of property obtained through the investment of cash, but also that produced by the effort and brain capacity of corporation management.

If the lowering of rates for service to the public is the only result of lower cost and increased efficiency—through adaptation of new arts and methods in production, the application of the highest business acumen, the development of the highest efficiency among the employees by the cultivation of an unusual *esprit de corps*, the maintenance of physical property in the condition to secure best economy—then the incentive to this result will be removed. Investigators of the results of government ownership very generally agree that incentive to progress

is largely lost through failure to recognize the individual efforts that result in improved service or efficiency of operation. Proper rate-making must recognize these facts and reward owners and operators of public utilities in proportion to their interest, coöperation and success in rendering improved service, with corresponding efficiency.

The recognition of these facts may complicate the basis upon which rates are to be determined, but that can hardly be used as an excuse for the omission of this very important element in rate-making.

The efficiency of operation must be determined from a consideration of the existing local conditions and a knowledge of what may be accomplished by the use of intelligent management employing modern methods. The efficiency of two plants, identical in size, equipment and managerial skill, may be quite different under different conditions of loading. Compare two electric light plants, one of which with a load factor of 50 per cent. is enabled to produce its energy, per unit delivered, at a very much lower rate than a second plant having the same equipment, fuel, employees and management, but with a load factor of 25 per cent. There are actual physical conditions and laws which, despite the clamor of the public for reduced rates or the utmost endeavors of utility management, will not prevent a higher fair rate in one case than in another. Therefore, efficiency of management ought properly to be considered, determined and rewarded for each utility, separately, in fixing its rate of return.

**Value of Service.**—Consideration of the value of service as a factor in rate-making is not a new theory. One of the more recently inaugurated State Commissions has fully discussed the subject and approved the theory in the following illuminating statement:

“In short, from the standpoint of what traffic will bear, a sufficient and legitimate doctrine if properly understood and circumscribed but not as usually urged by the carriers, the apportionment here must fall, for the limiting maximum rate beyond which the carrier may not go and hold his traffic is always the amount the patron can afford to pay, while the limiting minimum rate below which the carrier cannot afford to do the business is the actual added cost to the carrier of such business over the cost which such carrier must, for other and independent reasons, incur. In short, it has appeared to us that both the courts and com-

missions have been in error in determining the lowest rate that a utility may reasonably and lawfully afford. This rate, the courts and commissions to the contrary, notwithstanding, may be, and often is, below the actual cost of performing an average unit service. For example, in the case of a hydroelectric company, it may be that the actual units of power available, cost, unit for unit, a certain amount in actual out-of-pocket expenditure. Therefore, if we view this subject superficially, we would immediately say that this company could not afford to furnish its commodity at a less rate than the actual out-of-pocket cost per unit. But, on inspection, it may appear that by reason of the impossibility of operating in every instance to maximum efficiency, there is excess property and excess expense incurred in performing the total service performed at any one time which will not be appreciably, if at all, increased by performing some additional service. Therefore, when it becomes a question of performing or not performing the additional service, under the circumstances stated, the utility does not and should not look to the *average* expense of performing the unit of service, but look to the *added cost and the added revenue alone*, which added cost may be much less than the average cost per unit and which added revenue may be less than the average revenue that must be required per unit. Therefore, in determining whether or not such added business shall be done, the considerations we have herein discussed are the ones a wise economy will require to be studied.”<sup>1</sup>

The Interstate Commerce Commission has recognized this principle in its decisions where, for example, it says:

“while in fixing reasonable rates and relative rate adjustments, distance must always be considered as bearing, both upon cost to the carrier in performing the service and the value of the service to the shipper. There are many other facts such as density or sparsity of traffic over and along the lines of movement, comparative cost of construction and operation, and competitive conditions, which must be given weight.”<sup>2</sup>

“The value of the services in themselves is to be considered and not exceeded. These views seem to be consonant with reason. They are also established by the highest judicial authority in our country.”<sup>3</sup>

One of the Massachusetts commissions, the Board of Gas & Electric Light Commissioners, recognize that rates may have to be less than the cost theory would dictate, in order to secure the business, in the following language:

“The company’s customers may be broadly divided into two groups, those who are dependent upon the company for their supply and those

<sup>1</sup> Southern Pacific Railway.

<sup>2</sup> Union Tanning Co. vs. Southern Railway Co.; decided Feb. 4, 1913.

<sup>3</sup> Kennebec Water District vs. City of Waterville et al, 97 Me. 210-202.

who may readily supply themselves in other ways or by other forms of power. To the first the company may dictate the price, controlled only by motives of business expediency, its own sense of justice and its duty as a public servant. To the second the company must so fix the price as to secure the customer's business or else go without it. The variety and wide range of the prices offered by the company are ample evidence to its recognition of these facts."<sup>1</sup>

The Wisconsin Commission has recognized the value of service as an element in fixing rates, authorizing rates for service in a number of instances at less than cost determined from a consideration of investment, notably in the Madison Case, where the Commission says:

"The contract for this current (sold to a street railway company), was taken by the respondent on terms that, on the ordinary basis of figuring, yield very little in the way of profits. In fact, it appears to have been taken on the additional cost basis. That is, the respondent, in taking it, based its conclusion largely on the increase this additional business would cause in its operating expenses. It apparently had to adopt this course because the business could not be had on better terms, and on the theory that it was better both for itself and the rest of the consumers to take on the street railway, even if the income from it yielded less than the average rate of return on the investment."<sup>2</sup>

"The demand expense for the station was apportioned between arc, incandescents, power, and railway, on the basis of the average demands on the station by each of these four branches of the service at the times of the maximum demands on the station as a whole. This unit was used because the facts indicate that it appeared to be logical as well as fair. The output expense for the station was allotted to the arc, incandescent, and power on the basis of current generated, while to the railway it was allotted on the basis of the cost of additional business. The kilowatt-hours of current generated appear to be the proper basis upon which to apportion output costs, while the additional business basis can only be justified under special or rather exceptional conditions. \* \* \*

"It is for these reasons, mainly, that in computing the cost for the railway department we confined ourselves mostly to such expenses as were added to the operation of the respondent's plant by taking on the business of the street railway. This basis for fixing rates, however, has well-defined limitations. It would seem that it can be justified only in cases where the additional business can be had on no better terms and where these terms are such as to yield something in the way of profit

<sup>1</sup> Report of Board of Gas and Electric Light Commissioners of Massachusetts, 1913.

<sup>2</sup> State Journal Printing Company vs. Madison Gas and Electric Company, 4 W. R. C. R., page 670.

and are not unjustly discriminatory. That it would not be sound practice, from the point of view of either business or public policy, to accept such additional business at rates that would not cover the additional cost of taking it on, when this cost includes ordinary operating items which are affected, together with taxes, depreciation and something in the way of return on the investment, needs no argument. While in this case the rate paid by the street railway company is low, it is probably not so low as not to come within this rule. Had the street railway been charged the full proportion of all the expense items, including taxes, depreciation and interest, but omitting general expenses, the cost for the street railway on the basis of apportionment used here would have amounted to about \$30,232."<sup>1</sup> (Found by the Commission, \$19,254.99 Ed.)

Both the Public Service Commission of Washington and the Supreme Court of that State held that the value of the service must be considered in fixing rates. The Commission in a recent case has said:

"In this case as in all rate cases, there are two factors which must be given consideration, to wit: 'The cost of furnishing the service' and 'the value of the service to the patron.' What we have said thus far bears particularly on the first factor. The other factor cannot be ignored particularly when as in this case the opinion of the Railroad Commission and that of the Supreme Court show that the value of the service to the patron was given great, if not controlling, weight by the Railroad Commission in making the orders we are now asked to vacate."<sup>2</sup>

The Supreme Court said:

"Hence, in determining the reasonableness of railway rates, consideration must be given, not only to the carrier, but to the individual requiring the service. The company is entitled to adequate recompense for the service it performs. The individual is entitled to a rate that he can reasonably afford to pay for the service he requires. Upon this point, both judicial and economic authority agree. (Page 84.)

"From these authorities, the true rules can be gathered, that rates can go no higher than the service is reasonably worth to the public requiring the service, and that the reasonable value of the service to the public may be insisted upon, even though charges so limited would fail to produce a fair return to the carrier upon its investment."<sup>3</sup> (Page 87.)

<sup>1</sup> State Journal Printing Company vs. Madison Gas and Electric Company, 4 W. R. C. R., pages 665-6, 671.

<sup>2</sup> The Public Service Commission of Washington vs. Puget Sound Electric Railway—cases 74-76, page 118, 4th Annual Report of the Public Service Commission of Washington.

<sup>3</sup> 65 Washington Reports 75.

**Interest and Reward.**—In the present rapid development of the principles of rate-making, there has been but little recognition of reward or profit as distinct from interest on the value of the property used in rendering public service. Capital lying idle in a bank is normally entitled to the ruling rate of interest in the particular locality in which the capital is available, but a similar payment of interest upon investment, intelligently and fairly made in any going enterprise, is not in any way a fair return to the originators, or owners, of the enterprise in payment for their making such investment, assuming the risk of such utility, and displaying the ability or rendering a service in carrying on such business.

Capital is entitled to a definite return in any given locality, regardless of its use; enterprise results in efficient handling of capital and is, therefore, entitled to its own specific reward, dependent in amount upon the grade of efficiency developed.

In considering the charges that should properly be paid by the public for the service rendered in order to determine rates, the following items should be included:

*First.*—Operating expenses, including such items as fuel, labor, management expenses.

*Second.*—Taxes.

*Third.*—Depreciation, including:

- (a) Ordinary wear and tear.
- (b) Renewals and replacements.
- (c) Reserves for accruing exhaustion of property.
- (d) Inadequacy and obsolescence.

*Fourth.*—Amortization, or sinking funds, where necessary to provide for the extinguishment of investment, as in the case of limited franchises.

*Fifth.*—Return proper for local conditions on the value of the property fairly required in carrying on the enterprise.

*Sixth.*—Reward, or profit, to the owners.

It has been customary in most decisions of commissions and courts to allow merely a "fair rate of return," upon the value of the property including in the rate what is here divided into interest and profit. The trouble with this procedure of public authorities is that it fails to properly recognize the two classes of reward; one for investment, and the other for enterprise. Both rewards are usually rolled into one, too rarely exceeding a fair rate of interest.



The fallacy of attempting to fix the rate of return to be allowed a public utility, merely from a consideration of the amount of capital expended, would mean that the corporation with the most elaborate and costly installation would be entitled to the largest revenues, while a less pretentious, but more intelligently planned and economically constructed property, doing as large or a larger business, would in effect be penalized for their greater effectiveness in design and ability to attract and hold business. Such basis of valuation would mean that with the same return allowed upon investment, the most economically constructed property would of necessity make lower tariffs, and, consequently, would tend to secure all the business, leaving the more costly property without sufficient revenue to meet even operating expenses. The truth of this line of argument is recognized in the making of steam railroad rates to competitive points, where the amount of investment is not made the basis of rates. Development and initiative ability are recognized as entitled to rewards, otherwise, there would be no improvements, or any inducement to development and improvement.

A very common method of carrying on building operations is to employ a contractor who is paid the actual cost incurred in purchase of materials, labor and other expenses of building the structure, plus 10 to 20 per cent. to cover the cost of his services, ability and management. The contractor may have no plant equipment of his own, or in any case his investment in such plant as might be necessary for the construction of the property in question would be but a relatively small amount, and a return on such contractor's plant would in no way compensate him for his time and ability. The contractor is paid his percentage on the amount of his "turn-over;" that is, the sum of the expenditures made for material and labor in completing the structure.

A reward, which may properly be called a "commission," based upon the amount of business done, that is, upon the revenue, permits a uniformly applicable and exact ascertainment of that reward without regard to the amount of capital invested. By way of illustrating one set of conditions, take the case of two non-competing utilities having the same amount of annual gross revenue, they would be allowed the same rate, or percentage as commission, on account of the business done. Assuming that one of the utilities is required by the necessity of its business to invest a large amount of capital as compared with

the other, then both will be allowed (under the same local conditions) the same rate of return upon the capital invested, but the company having the greater capital investment receives a total aggregate amount, as its annual return, larger than the other company, which is both fair and reasonable. If the conditions are different, both utilities having property of equal value, but the first does twice the annual business of the second, then the rate of return on capital being the same, the aggregate amount received annually by each as interest, is the same, but the commission received by the first utility will be twice that received by the second, both being allowed the same rate or percentage on their gross revenue, thus the second, by reason of more effective utilization will receive the greater gross return. For the sake of simplicity, no mention has been made, in the preceding illustrations, of the profit which should or should not be allowed the utilities, but which, of course, must be independently considered and determined. It may well be that while interest, profit and commission are each fixed separately for any given utility, their sum may actually or approximately equal the sum of like allowances for another and different utility, that is no reason why each case should not be logically and equitably decided upon its own considerations, for "there is no necessary relation between a 7 per cent. return on capital, and a 10 per cent. return on income."

The proposal to analyze and divide into its components the total reward to be allowed utilities, may at first sight seem complex and unnecessary, but in order to insure justice and a proper consideration of all elements making up the rate of return, it is believed the separation of interest as distinct from profit, and both from commission, permits a clearer appreciation of what is being considered, makes easier a comparison with what corresponds to rewards allowed in ordinary commercial transactions, and allows a fairer determination of the amount of return proper for each class of service.

"To illustrate a rational method of determining reasonable profits, let us take the steam railways of America, and let us assume that the capital invested in their construction and equipment is \$45,000 per mile of roadbed. Then, according to data given in the Interstate Commerce Commission Report for the year, 1906, and upon this assumption of first cost, we have:

	Per mile of road
Operating expense (including renewals).....	\$6,896
Taxes.....	337
Interest on \$45,000 at 4½ per cent.....	2,025
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Total cost of production.....	\$9,258
Operating revenue.....	10,460
Deduct cost of production.....	9,258
<hr/>	
Profit.....	\$1,202

"This profit is about 11½ per cent. of the operating revenue. It is not quite 2.7 per cent. of the assumed investment of \$45,000 per mile. Hence the total return on capital—viewing the matter from the old standpoint—is 2.7 per cent. profit and plus 4.5 per cent. interest = 7.2 per cent.

"It may chance, therefore, that a 7 per cent. 'return on capital' invested in railways gives a true profit of 10 or 11 per cent. on gross income, and that this return is reasonable in that such managerial ability is suitably rewarded by its 10 per cent. profit; but there is no necessary relation between a 7 per cent. 'return on capital' and a 10 per cent. return on income."<sup>1</sup>

As indicating other elements than mere value of property or investment, mention is made of the following considerations that should be given weight in steam railroad rate-making.

Economies and lower rates for service have resulted from developments, improvements and inventions that must be credited to aggressive, efficient management; for example, the use of large freight cars has amply demonstrated their economy. Fifty years ago, a 15,000-lb. freight car indicated what was normal, whereas the present representative cars have a capacity of from 80,000 to 100,000 lb. This means that very much greater carrying capacity is obtained by a comparatively small increase, not only in operating expenses, but also in fixed charges, which are a relatively much smaller investment per unit transported. Train loads which for long hauls may now be perhaps considered standard at 2,000 tons were almost unthought of only a dozen or fifteen years ago. The economy of all locomotive operation has been largely improved during the last 10 or 20 years due, not only to improved efficiency and power of the locomotives themselves, but by reason of their more intensive use, resulting from better and more intelligent supervision.

<sup>1</sup> *Engineering-Contracting*, May 25, 1910 (pages 467-8), pertaining to "A rational method of determining reasonableness of rates charged by Public Service Corporations and a discussion of the theory of profits."

As illustrating the *reductio ad absurdum* to which the steadfast and logical adherence to the principle of allowing returns on only the value of physical property, the decision of the Railroad Commission of California, in the matter of rates of charges authorized the Wells Fargo Express Company, is illuminating.

The capital invested in the physical property of the express companies is relatively small compared with the service rendered or the gross revenue received therefrom, because the transportation is done mainly by the railways. The recent decision of the Interstate Commerce Commission seriously reducing all express rates seems to have failed in making due allowance for the reward for service. The same views, that return on the value of the physical property only, should be allowed the express companies, is shown by the recent decision of the Railroad Commission of California.

This Commission in determining the revenue, operating expenses, net income and value of the physical property, of the Wells Fargo Express Company used for intrastate business in California, in 1911, arrived at the following figures:

Gross revenue.....	\$4,508,436
Operating expenses, payments to railroads for transportation.....	1,937,019
Terminal expenses.....	1,343,108
Overhead expenses.....	89,733
Line expenses.....	294,127
Miscellaneous.....	266,027
	<hr/>
	\$8,438,450
Less deductions.....	105,745
	<hr/>
	\$8,332,705
Net income.....	684,165
	<hr/>
	\$7,648,540

In arriving at the above figures, showing a net income of \$684,165, more or less arbitrary assumptions were made as to the division of expenses of an interstate and intrastate business. On the basis of certain other assumptions the Commission found the net income from intrastate business to be \$842,097 and upon still slightly different assumptions it found the net income to be \$695,691. From a consideration of these three results and the value of the physical property as found by it to be \$613,233,

the Commission concluded that \$61,323 should be taken as the fair net income from intrastate business properly allowable for the year 1911, concluding with the following:

"We have already found that the net revenue from California intrastate transportation business during the year here considered was not less than \$684,165.90, which represents a little more than 111 per cent. of the total value of the company's property devoted to the public service in this State, conceding to the company practically everything it asks; or, taking the second method of apportionment, the net earning is in excess of 136 per cent.

"Allowing the company 10 per cent. on the basis of valuation of its property of \$613,233.85 gives a charge of \$61,323.39 as the earning to which the express company is entitled after paying all of its operating expenses, taking care of depreciation and all charges necessary and proper in the conduct of its express business, and we shall prescribe rates which will allow the express company all of its charges to the railroads, its legitimate operating expenses, all of its other legitimate charges, including depreciation, and \$61,323.39 as a net earning upon its property."<sup>1</sup>

On the basis of the above, the Commission ordered the company to put in force a schedule of rates, or tariffs, promulgated by the Commission, which were planned to reduce revenue in line with the above quotation.

The reasonableness of attempting to fix a net income of \$61,323 as being a fair return merely on a physical property may be questioned when it is considered that this sum is obtained by approximate methods and based on revenues of over \$4,500,000. In ordinary engineering calculations 1 per cent. is considered so small an item as to be practicably negligible, yet a reduction in the net income of the express company of less than 1½ per cent. would entirely wipe out all return to the owners for the use of their property. The net income from intrastate business was found to be as small as \$684,165, or as large as \$842,097, depending on the methods used; a variation of \$157,932, evidently, merely an approximate figure, yet no reward was considered necessary for the business acumen, ability or the "going value" of the corporation, which permits it to develop a business having a revenue of over \$4,500,000. Such slight margin as \$61,323 on a revenue of \$4,508,436, is so

<sup>1</sup> Report of Railroad Commission of California, Decision No. 841, In the Matter of the Schedules or Tariffs of Rates of Charges of Wells Fargo Co., Case No. 122.

small and is so likely to be jeopardized by absolutely uncontrollable variations in business that the regulation of utilities on any such basis must result not only in the refusal of additional capital to enter such enterprises, but the confiscation of present invested capital and confidence.

The impossibility of determining proper tariffs from a consideration merely of the value of the property used in rendering the service is recognized by the Railroad Commission of Wisconsin, which, perhaps, as much as any other Commission or public authority, is definitely committed to the use of the value of the property used in fixing rates.

"It has also been the contention of representatives of localities along certain lines, and even along sections of such lines, comprising the entire interurban system, that the patrons of those separate lines or sections of lines having a higher traffic density and operating upon a better revenue basis should be granted fares lower than the fares computed upon a mileage basis. It is difficult, however, to see the justice of establishing such fares, especially when it is the object of this revision of existing rates to abolish, so far as practicable for the present, all special fares involving local discrimination. It is also the object of this revision of rates to bring about simplicity, uniformity and stability in the rate schedules applying to these lines by disregarding any differences in revenues or operating conditions. This is in line with the more modern theory of transportation rates. Take, for example, the regular passenger fares upon the steam lines within the state. The basic rate is 2 cts. per passenger mile and with few exceptions the fares are computed accordingly whether the company is large or small, whether the haul is long or short, whether the traffic is profitable or unprofitable, or whether the service is poor or excellent. If all these factors cited should be reflected in full force in the rates the probability is that the rates would vary all the way from 0.5 ct. per mile to 50 cts. per mile. But the nature of the transportation business is such that the demand for complicity, uniformity and stability is necessarily controlling because even a slight variation in basic rates would open the way to uncertainty in the minds of the riding public and would result in personal and local discrimination."<sup>1</sup>

While in every case, where the rendition of service is concerned, the greatest use of property, reasonably obtainable, should be required, yet a difference in the habits of the citizens, the number and type of manufacturing concerns, and other local conditions

<sup>1</sup> Opinion and decision of Railroad Commission of Wisconsin, *Robert S. Schmieder et al. vs. Milwaukee Light, Heat & Traction Co.*, decided Jan. 2, 1914. 13, W. R. C. R., 489.

prevent the establishment of a minimum "load factor" as uniformly attainable, and compels its determination in each individual case. To further illustrate the unique conditions which control considerations on which to base reward, take the case of an actual electric light and power utility, which originally located its generating station convenient to a railroad, where there was an available supply of water that seemed ample for years to come; with the development of the business over a period of 15 years, additions and extensions to the power plant were made without unreasonable accretions in capital account. But as the result of progressive management, concentrated business-getting methods and the continued greater use of electrical energy on the part of the public, the demand upon the power station passed beyond the limit of maximum utilization of the original plant and its water supply, making necessary the construction of a new station at a different site where there was an unlimited supply of water, and where the now developed demand for electrical energy warranted the building of a spur track to be used exclusively for the new power plant. The new plant has cost in the aggregate nearly \$1,000,000, and has rendered useless the old investment amounting to \$600,000. Therefore, the proper charges to be borne by the public for similar service, must now be based on the \$1,000,000 investment, whereas slightly less demands on the part of the public permitted them to pay similar charges on only a \$600,000 investment.

In the case of a steam railroad handling a given amount of business well below its maximum capacity, it may add small increments of traffic with no increase in charges for capital account, and with but small increase in maintenance and operating expenses: first, simply by better loading without any noticeable increase in the sum total of its annual charges; second, by slightly increasing the frequency of the service, with somewhat larger expenses for fuel and wages, a still greater and substantial increase in the amount of business can be obtained. This increase of effective utilization can continue up to a certain point, when additional locomotives and cars must be provided and finally a point is reached where it is necessary to add additional right-of-way and very materially add to the capital account with consequent increase in fixed charges. Up to the point where there is no substantial additional outlay of capital, effi-

ciency of utilization of the property is steadily increasing with increase of business, but when such efficiency has reached its maximum, requiring large additional outlays for new plant, the efficiency may drop to a low figure, and this result is due entirely to the fact that the business has increased to just beyond the limits of the capacity of the original property. Thus, at the point of maximum utilization the rates that would pay more than a fair return—even a handsome profit to the investors—will be found inadequate to make a fair return and may even show a deficit after the expenditure for the additional property investment required by a relatively small increase in business, beyond the capacity of the original property. Consequently, it will be seen that the largest tonnage per mile that a railroad can safely and effectively crowd on to its line will result in the lowest charges, at the same time affording proper return to the investors.

In steam railroad operation where a large proportion of the total charges are constant, irrespective of the amount of business done, the fixing of rates on whatever basis, particularly where large consideration is given to the value of the physical property alone, may result in confiscation, unless the business conditions of the country at large are considered when fixing the rates.

To illustrate the unfairness of ignoring the principle of rewarding enterprise in fixing rates, consider two communities, "A" and "B" similarly situated, each having a population of 50,000. "A" has a live, progressively managed electric utility with up-to-date commercial methods. "B" has similar equipment, so far as apparatus is concerned, but it does not appreciate the possibilities of the business. Therefore, the practical results of operation are shown in the following tabulation:

TABLE I

	A	B
Capital invested.....	\$1,575,000.00	\$1,125,000.00
Average sales rate per watt-hour.....	0.04	0.06
Sales per capita.....	8.00	5.00
Gross earnings.....	400,000.00	250,000.00
Operating expense (ratio 60 per cent.).....	240,000.00	150,000.00
Earnings applicable to interest and taxes....	160,000.00	100,000.00
Taxes on the basis of \$5 per hundred gross earnings.....	20,000.00	12,500.00
Earnings applicable to dividends.....	140,000.00	87,500.00
Per cent. equivalent on capital invested.....	8.7	7.7



"A" has used 10,000,000 kilowatts per annum, while "B" has had the benefit of only 4,166,000. "A" has received in taxes \$20,000, while "B" has received \$12,500. In other words, "A" receives its service at  $33\frac{1}{2}$  per cent. less than "B" and is well served and well satisfied, while "B" is not satisfied with either its service or its rates, although the capital invested in the enterprise is receiving a less return than that invested in "A."

The conditions cited are not at all exaggerated, and the reports of the Public Service Commission for the last six years will show similar cases.

Let us assume in the example cited above that the Commission stands on the ruling that all companies shall be allowed to earn 8 per cent. and no more. "A" has in this case a return of  $9\frac{1}{2}$  per cent. greater than it should have, although it is furnishing nearly two and a half times the service and at one-third less rate than "B," and is paying \$7,500 more per annum in taxes. "B's" rate under the same ruling is too low, and should be raised sufficiently to bring in a return of 8 per cent. on the capital invested.

Until the present era of public utility regulation, the theory has never received serious consideration that dollars invested, practically without regard to the human ingenuity, efficiency and industry expended thereon, should be made the measure of reward. To-day, however, there are many advocates of this theory, and courts and commissions are holding that the value of the property entitles the owner to a rate of return, without reference to whether the owner uses that value indolently or aggressively. Much present-day thinking in relation to utilities seems to have lost sight of the fact that the ability to do business and render service is entitled to reward, even though there be little or no property employed therein. Yet, in practically all other lines of business, such rewards are conceded.

A merchant figures his profit on a percentage of the sales, not upon the value of his stock on hand. He turns over his stock several times each year and the more times that he can turn it over, the greater his profit, and this is as it should be, because "the harder money is made to work" the greater should be the reward to the owner.

<sup>1</sup> J. T. Hutchings, General Manager, Rochester Railway & Light Company, before the New York State Waterways Association, June, 1914.

## CHAPTER V

### COST OF REPRODUCTION

**Development of Theory.**—A consideration of the conflicting views and many theories promulgated for determining value leads many a practicable mind to turn to actual cost in money as the proper measure of value. To the lay mind it would seem as if the basis for rates might well be made the amount of money expended for the benefit of the public. But it will be immediately recognized that a part of the money spent may have been expended recklessly, improperly, or for property which is no longer in existence. A common experience will indicate that cost does not necessarily indicate present value. Present value may, on the one hand, be much less than cost if property has been allowed to depreciate, has been injured by accident, exhausted by service or wrecked by mismanagement, on the other hand, it may be more than cost if property has increased in value through appreciation of real estate, improvement of operating conditions, superior management or desirable location. As a matter of fact the greater the separation in point of time, between cost and the date of valuation, the greater the difference may be between expenditure and value. When the date of cost and the date of value to be determined are the same, expenditure honestly and intelligently made is a fair measure of value. This latter consideration has led to the very general acceptance of the cost of reproduction theory in determining the present value of any property.

It is a method universally applicable for determining the existing or present-day value of utility property, because it furnishes an estimate of the cost of producing a like property at to-day's costs.

"Reproduction cost is based upon the assumed recreation or substitution of an identical new plant at present prices according to the existing apparatus, specifications, assuming reasonable diligence and methods and a reasonable period of time in construction."<sup>1</sup>

<sup>1</sup> Mr. W. H. Blood, testimony before Public Service Commission of Missouri, October, 1913.

An attempt to ascertain present value by modifying the figures of original cost or investment to meet one's ideas of the cost of existing property is no less speculative or theoretical than the determination of present value by using present-day prices applied to existing property. On account of this practical difficulty of modifying original cost and because of the absence or indefiniteness of old records the method of using to-day's cost for pricing property has been quite generally taken and accepted as the most important element to be considered in determining the value of existing utility property.

"The cost of reproduction of tangible property is at present the most generally accepted basis of valuation for purchase or rate-making. Its great advantage is that it is comparatively easy of ascertainment."<sup>1</sup>

"Reproduction cost new is the basis upon which substantially all modern appraisements are made. It is the most fair, from the fact that it is based upon existing conditions and it is not especially difficult to determine market prices for materials and labor at the time."<sup>2</sup>

The cost of reproduction method has been used, with some differences as to detail methods and unit prices, both by the experts for public authorities and the appraisers employed by the corporations in ascertaining the present value of utility properties. The courts themselves have sustained and approved this method. The Supreme Court, in the Knoxville Water Company case, said:

"The cost of reproduction is one way of ascertaining the present value of a plant like that of a water company."<sup>3</sup>

The method was also used in the Consolidated Gas case where the value thus arrived at was made the basis of rates approved by the Supreme Court. In the more recent Minnesota rate case the Supreme Court said:

"The cost of reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty."<sup>4</sup>

The Supreme Court of Idaho has recently upheld the methods of the State Utilities Commission in using the reproduction

<sup>1</sup> Whitten, "Valuation of Public Utilities," Sec. 639.

<sup>2</sup> Foster, "Engineering Valuation of Public Utilities and Factories," page 14.

<sup>3</sup> City of Knoxville vs. Knoxville Water Co., 212 U. S. 9.

<sup>4</sup> Minn. Rate Cases, 230 U. S. 452.

method for ascertaining the value of utility property in rate-making, the Court saying:

"This Court is of the opinion that the rule of cost of reproduction less depreciation, adopted by the commission, is the correct general rule or principle to be applied in this class of cases."<sup>1</sup>

The Court then goes on to state that

"The worth of a new plant of equal capacity, efficiency and durability \* \* \* should be the measure of value, rather than the cost of exact duplication."

explaining that the only deduction for depreciation should be for

"actual, tangible depreciation, and not for theoretical depreciation, sometimes called 'accrued depreciation.'"

Perhaps the best considered declaration on the subject of using reproduction cost as the best evidence of present value is the Federal Court's decision in the Louisville Railroad case. It involved the constitutionality of an act of the legislature in establishing railroads' rates, and hence is a rate case. Speaking on the subject of reproduction cost, the Court says:

"In reference to the question of value with the view of rate regulation, the most reliable test ordinarily is the cost of the reproduction of the road as it exists. \* \* \* The original cost of a road may in some cases reflect light on, or even determine, the present value, as when it is of very recent construction. But ordinarily it is of little assistance in that regard, since many items of value may be donations by the government, or by individuals, as in the case of the south and north, or the road may have been built long before the period of inquiry at greatly less or greatly higher prices than those prevailing at the time of the inquiry. Or its original cost might be involved in obscurity and may include the cost of abandoned or destroyed portions of the property, which should not figure in the inventory for the present time, or the road may have been bought at a forced sale in times of panic at a nominal price or in inflated times at a corresponding price; or the road, costing little originally, may have developed from many contributing causes into being property of great value. And in every case, after finding the original cost, when possible to be done, the question would still have to be solved as to whether such original cost is the same as the present value, which would involve the determination of the present value for such com-

<sup>1</sup> Murray vs. Public Utilities Commission, 150 Pacific Reporter 50.

parison independent of original cost, and in no other or better way than on reproduction values."<sup>1</sup>

"It is a fair return upon the reasonable value of their Minnesota property in 1908 to which these companies were entitled, and the cost of that property at times varying from 5 to 40 years ago may be some evidence, but it is certainly no criterion of its value in that year. In view of these facts the master rightly decided that the cost of reproducing this property new was a more rational and reliable measure of its real value than the original cost of its acquisition and construction or the market values of the stocks and bonds of the companies and upon such basis he made his findings."<sup>2</sup>

In the Consolidated Gas Company case where the cost of reproduction was made the basis of value upon which rates were fixed, Judge Hough, in the course of his opinion, gave his idea of the cost of reproduction as related to value in the following clear language:

"It appears by undisputed evidence that some of these last items of property cost more than new articles of the same kind would have cost at the time of inquiry; that some of designs not now favored by the scientific and manufacturing world, so that no one now entering upon a similar business would consider it wise to erect such machine or obtain such apparatus. In every instance, however, the value assigned in the report, is what it would cost presently to reproduce each item of property in its present condition and capable of giving service neither better nor worse than it now does." (Page 854.)

"As to all of the items enumerated, therefore, from real estate to meters, inclusive, the complainant demands a fair return upon the reproductive value thereof, which is the same thing as the present value properly considered. To vary the statement: Complainants' arrangements for manufacturing and distributing gas are reported to be worth the amounts above tabulated if disposed of (in commercial parlance) 'as they are.'

"Upon authority, I consider this method of valuation correct."<sup>3</sup> (Page 855.)

"The great and substantial question of fact, in this case, is as to the value of the plant. What a plant cost originally is not the measure of value that courts must look to, to determine the validity of rates. The value of stocks and bonds is no test, for obvious reasons, and

<sup>1</sup> Louisville & N. R. Co. vs. Railroad Commission, 196 Fed. 820.

<sup>2</sup> Shepard vs. Northern Pac. Ry. Co. *et al.*, 184 Fed. 803.

<sup>3</sup> Consolidated Gas Company vs. City of New York, 157 Fed. 849.

mere theorists only, at the present day, insist upon such as the valuation. Practical men know that it is not the test. There can be no true test, other than the physical valuation, and to such physical valuation there must be added certain other items.

"This case seems to have been tried before the master, by both parties, upon the reproduction theory; that is to say what this plant would cost if it were blotted out of existence, and the city, or some other company, were to undertake to reproduce the plant."<sup>1</sup>

The most important single piece of valuation work now being carried on is that of the Interstate Commerce Commission in valuing the steam railroads of this country. The cost of reproduction new is being ascertained, and in reply to an inquiry submitted by Director Prouty, representatives of the railroads stated their position as follows:

"In determining the cost of reproduction new, reference shall be had to the conditions as they exist at valuation date, but the historical construction of the property must be taken into consideration whenever a rational engineering program for reproduction would so warrant or require. Conditions existing on the valuation date as to population, business capacity, and productiveness and property values in the territory served by the carrier are to be taken.

"The same quantities and classes of grading materials which were originally obtained on the right-of-way will be deemed to be obtainable in the same places, and the present cost of moving the same will be ascertained. The cost of acquiring other necessary materials from the most available sources on valuation date will be ascertained."<sup>2</sup>

The views of the railroads with regard to the above are further explained by them as follows:

"The reproduction new cost figure thus required, represents the cost of an identical reproduction of the existing plant at the present time, at proper present prices, and under present conditions, the historical construction of the property to be taken into consideration in order to aid in the ascertainment of the items comprising the transportation plant, or incidental to its production, quantities and the character thereof, in the ascertainment of contingencies, and in the determination of an appropriate economical engineering program for the reproduction of the property."<sup>3</sup>

<sup>1</sup> Des Moines Water Co. vs. Des Moines, 194 Federal 197.

<sup>2</sup> Brief filed on behalf of the railroad companies represented by the Presidents' Conference Committee, before the Interstate Commerce Commission, Sept. 1, 1915, pages 36 and 39.

The authorized representatives of public utility commissions of the various states having to do with railroad properties, answered Commissioner Prouty's inquiry as follows:

"As a general principle, cost of reproduction new should be determined on the basis of present conditions."

The cost of reproduction has, in very many instances, been used in ascertaining the value of the physical property only. There is no reason why the principle and the method should not be used uniformly in ascertaining the value of the entire property of any utility. In practically all valuation work the cost of reproduction, present-day prices, namely, the basis of a transaction between a willing seller and a willing buyer, has been used in determining the values of real estate and rights-of-way. The courts have uniformly and definitely ruled that the present value of land is the only value to be considered in determining the value of such property of public utilities. Consequently, even those authorities who have adopted other bases than reproduction cost for ascertaining the value of the remaining parts of the property, have added to such values the present value of real estate, in order to determine the total value.

It has been a very common practice in the valuation of utility property to use the present cost of reproduction of physical property, adding thereto the original cost of developing the business, in order to ascertain the total value of a given property. This method was formerly allowed practically exclusively by the Railroad Commission of Wisconsin and has the weight of court approval, as shown in the following pages under "Going Value." There is, however, no reason why "going value," as well as other physical, non-physical or overhead charges, should not be determined by the consideration of present cost of reproduction rather than historical, original cost. Certainly, from the standpoint of consistency and logic, any estimate that is made up on the basis of reproduction cost for the greater part of the total property, should use the same uniform basis throughout; failure to apply the same standard of measurement to all parts of the property might well seem to provide grounds for raising questions as to the legality of any such hybrid procedure.

The two methods, cost of reproduction and original cost, should be kept separate and distinct, otherwise great harm may be done either to the public or to the utility. There is a tendency among

certain engineers, and, to a limited extent, in the decisions of the commissioners, to confuse the two methods. Any such procedure is an abandonment of the reproduction method. It is a mixture of that method with the original cost method. The fallacy of such procedure is primarily due to the fact that its supporters are trying to find one sum or cost, which alone is to be considered the value of the property. But the courts have decided that there shall be ascertained several different costs; namely, reproduction cost, original cost, reproduction cost less depreciation, and from a consideration of all of these and other costs, and the exercise of a wise judgment, the fair value of the property is to be determined.

Under the reproduction method, to be consistent and logical, the cost should be figured or determined upon the basis of existing, to-day's conditions. Alongside this estimate may be placed the actual original cost, if it can be determined, and the other estimates based on the other lines of pertinent proof, as indicated in the *Smyth vs. Ames* case, but there is no logical or legal warrant for determining cost, as an element of value, by basing it partly upon the reproduction method and partly upon the original cost method or basing it on present prices applied to historic conditions.

Perhaps the reason for taking cost or historical values for structural property and reproduction or market value for land and combining such figures in ascertaining the total value of utility property, may be found in the explanation made by Ex-Chairman Stevens of the Public Service Commission of New York, Second District, where he says:

"The land owned by the respondent consists of five distinct parcels which are carried upon its books at \$54,601.45, this being their cost. This is the sum at which they are carried in the examiner's report. Land has a value for other purposes than that of carrying on the proper business of the company. It could be retired from the service at any time at its market value for such other purposes. This fact differentiates it from the property which is valuable only for company operations, and it has been universally held that a company is entitled to a just and reasonable return upon the present value or market value of the land used by it in the public service. It is clearly distinguishable in principle from those things which have no value except in the service of the company except scrap value."<sup>1</sup>

<sup>1</sup> 3 P. S. C. 2d D. (N. Y.) 656.



The Massachusetts Public Service Commission has this to say with regard to the reproduction cost theory:

"It is a matter of common knowledge that in Massachusetts during recent years this reproduction cost theory as a basis for rate-making has been urged on behalf of certain public utility companies, mostly gas companies that have accumulated out of excess earnings or unearned increment upon land values, large amounts of property not represented by the original capital invested or by the stocks and bonds issued under our anti-stockwatering laws.

"Undoubtedly in rate cases and other cases involving the conflicting rights of the rate-paying public and the investing public, the cost of reproduction may frequently be a fact desirable to be ascertained, and sometimes it illuminates important aspects of the problem presented; it is often the best method of checking up unsatisfactory accounting, particularly when dealing with depreciation. But as a fundamentally controlling principle, no theory could work out grosser injustice—to the rate-paying public in some cases and to the investing public in other cases—than the reproduction cost theory. In cases where rates have for years been too high, so that the companies have accumulated, out of excess rates paid by the public, large amounts which have gone for capital purposes, this theory requires the rate-payer to pay a rate adequate not only for a return upon the capital furnished by the investor or stockholder, but adequate also to furnishing capital and a return upon the capital furnished; it would authorize the capitalization of excessive rates and a return upon that capitalization. This is to put a premium upon extortions, past and prospective. On the other hand, this theory is grossly unjust to prospective investors in that even when the investment is made with entire honesty and with reasonable prudence, yet if, pending the building up to the new business, the plant depreciates below the fair cost to the investors, rates must under this theory be made adequate to make return only upon the reproduction cost of the property in its depreciated condition. This amounts to saying that money lost during the earlier stages of a public service enterprise is *irretrievably* lost by the stockholders; that if, perchance, rates have been fixed so low that the rate-payer has for a period of years obtained a service at less than cost, this is the permanent misfortune of the stockholders, and that the public should never, at any time and under any circumstances, be called upon to make up a deficit thus incurred. On this theory copper put into the telephone service at 25 cts. a pound is now to be reckoned as worth about half that sum. Every fluctuation in prices involves the ascertainment of a new rate basis. This theory is as inexpedient as it is unjust."<sup>1</sup>

<sup>1</sup> Decision of the Massachusetts Public Service Commission, Approving an Increase in the Rates of Fare of the Middlesex and Boston Street Railway Company, Oct. 28, 1914.

Admitting that regulation has existed in the State of Massachusetts for a number of years, it can hardly be claimed that even the Massachusetts Commission has heretofore been assuring investors that they were to get their investment back or that early losses would later be made good. Certainly such assurances could not have been made to investors in States that have never had utility regulation until within the last few years, consequently the investors, presumably in Massachusetts and certainly in other States, have actually been making their investments upon the basis of standing the losses or gaining the profits, as the case might be. Warrant for such basis of investment is found in the rulings so frequently made by the Supreme Court, that the present value of the property at any given time is the basis upon which rates must be determined at that time. It may be well enough for the commissions to inaugurate a policy and give more or less definite assurances as to the safety of investments and the recouping of early losses, but in so doing, the present fair value of the existing property must be taken as the starting point, not original investment plus early losses. Certainly such assurance on the part of the public authorities would be eminently fair, usually legal, and would undoubtedly result in the securing of capital at a lower rate of return than under the conditions heretofore existing, where the investor had to cover the loss or gain made in his investment by the rate of return obtained. The Massachusetts Commission is wrong in stating that "no theory could work out grosser injustice" than the reproduction cost theory, because that theory is of fundamental importance in ascertaining present fair value, which value is the one that both the investing public and the rate-paying public have been accustomed to consider the fair and proper value in determining rates. There is no reason to imply that "investments honestly and prudently made and wisely managed" may not be as fully and fairly protected by allowing a rate of return sufficiently high to cover the occasional loss of investment as to permit only a lower rate of return upon the original investment, regardless of its present value, with a view to insuring each such investment. The writer has no quarrel with the principle that honest investments should henceforth be protected, that a uniformly fair return thereon will be assured, that early losses will be made good, but in establishing this new régime *ex post facto* rulings must not

be attempted by the substitution of original investment for present fair value, which the courts rule is the starting point for consideration in determining the basis of rates.

In summation, it may be said that the cost of reproduction method should usually be given the greatest of weight of any of the elements to be considered in fixing the present value of utility property, because:

The reproduction method is universally applicable.

The reproduction method gives the present-day value of the property.

The reproduction method is an eminently feasible and practicable method of arriving at value.

The reproduction method has been approved by the highest courts.

**Reproduction New.**—The reproduction theory, as originally developed, consists of estimating the cost of reproducing the existing property under present surrounding physical conditions, with present-day prices of labor and material, although widely fluctuating prices are usually averaged. Thus it will be seen that the reproduction theory attempts to fix the value of an entire property as it exists as a present going business, including any unearned increment due to increase over original cost of real estate, labor or material, as well as such reduction in value as results from improvements and economies in construction methods, decrement in real estate or structural cost. For example, a utility may have originally spent a large amount of money excavating a trench with hand drills and black powder that to-day would be built with modern machinery and high explosives, but in ascertaining the present-day value, the cost of doing the work with modern methods would usually be accepted. On the other hand, present cost of labor would be appreciably higher than labor for any period a few years previous, and so for most localities the present value of real estate would be considerably higher than its value a few years ago. The application of this method of utility valuation is merely applying to such corporations the same economic rule that is generally applied to private enterprises in fixing their values.

A modification of the above-described, strict reproduction method has been developed in the attempt to keep down the present values of existing utility property. This modification of the pure reproduction method consists in estimating the cost of

reproducing the existing property on the basis of current prices for labor and material, but differs by the substitution of original surrounding conditions of land and structures at the time of initial construction, in place of those actually existing at the time of the valuation. Thus, the utility gains by any increment in labor and material prices, but loses all enhancements of value due to rise in prices of real estate, appreciation in roadbed, adaptation and the like. The method may exclude or take advantage of modern methods of doing construction, as determined by the investigator.

A still further modification of the pure reproduction method has been developed in reproducing the existing property not as a whole, in a continuous process at one time, but rather in the manner in which utility properties are usually constructed, that is, by gradual extension or "piecemeal" or "retail" construction. This method, of necessity, results in a higher valuation than the wholesale reproduction method, because small construction jobs cost more per given unit completed than large jobs, and because continued accretions require tearing down, abandonment or reconstruction of property that has been temporarily completed.

Still another so-called, but inappropriately termed, reproduction method of determining value has been gaining favor recently. The method may be identified and very much clarified by coupling with it the term "original cost." The "original-cost reproduction" method consists of estimating the value of the existing property on the basis of the prices paid for labor and material at the time of the original construction of the existing property; said construction being assumed to be done under the original physical and surrounding conditions, at cost usually determined from an examination of the corporation books and records. As such method of valuation takes into account only the property actually in existence, excluding all that which may originally have been installed, but of which there is no longer any use being made, it will be seen that this method in no way corresponds to ascertaining the original total investment, or total cost to date, referred to in preceding pages.

The cost of reproduction new, as correctly interpreted for use in rate-making, therefore means the estimated cost of constructing anew the entire existing used and useful property, including

both physical and non-physical parts. It further assumes the estimate is based upon:

*First.*—The use of such prices as are fair and average at the time of the appraisal.

*Second.*—The application of modern methods and apparatus with intelligent supervision and direction.

*Third.*—A reasonable and yet as brief a period for construction as is practicable to avoid inflating normal costs of labor, material and financing.

To develop an estimate of the cost of reproduction, it is customary to start with the physical property, then to add to those costs first found what are loosely classified as "overhead items," and afterward to include the cost of establishing the business and other such non-physical elements.

The cost of reproduction new of the physical property includes the fundamental basic cost of land and the labor and material costs of structures, including engineers' and architects' fees, services of contractors where required, all kinds of insurance, and the costs of administration, inspection, testing and other similar expenses incurred during construction. To these basic figures, which result simply in reproducing new the physical property, there must be added certain non-physical or intangible costs of two classes:

(a) Those incurred in connection with the preparation of the physical property ready for service, including the cost of raising the money, taxes and interest before and during construction, expenses and services of the promoter, legal and engineering advice preliminary to beginning construction, expenses of securing franchises, permits or other public authorization, working capital and similar matters.

(b) The cost of developing and attaching the business, that is, securing a revenue. This includes interest or a fair return on the value of the property, the necessary allowance to cover deficits in operation and similar items that accrue until the property is put upon a paying basis.

The cost, preliminary to beginning construction of the physical property, will ordinarily run from 5 per cent. to 15 per cent. of the cost of the physical property. In the same way, the overhead allowances to be added to the basic costs of the physical property will amount to 12 to 25 per cent., depending upon general market conditions, the size and risk of the enterprise. The cost of estab-

lishing the business and obtaining a revenue sufficient to meet operating expenses and a fair return upon the value of the property varies with the character of the business and to some extent with the size of the corporation and the type of the community being supplied; it will vary from 10 per cent. to 50 per cent., but 20 per cent. of the cost of the physical property is not an unusual figure.

### **SUMMARIZED ELEMENTS OF REPRODUCTION COST**

#### **1. Land:**

- (a) Real estate and water-rights.
- (b) Rights-of-way, easements, etc.

#### **2. Structural Costs:**

- (a) Physical property: construction and equipment.
- (b) Contractor's services: including purchasing of materials and equipment, assembling, conducting, superintending and executing work.
- (c) Engineering and supervision: including architect's fees, designing, estimating, testing (on all construction and equipment items).
- (d) Administration and management: including legal work on construction, rent and upkeep of offices and storerooms, salaries, accounting, city inspection, printing, stationery and other management costs on construction.
- (e) Omissions: incomplete inventories, buried, submerged, concealed or inaccessible construction, loss and waste, incomplete unit prices.
- (f) Incidentals: items too small to inventory, watchmen, heating, rent of land or construction buildings, duplicate or temporary work.
- (g) Contingencies: corrections, disasters, delays, strikes, idle labor, overtime, uninsurable losses, expressage on rush shipments.
- (h) Insurance: fire, casualty, builder's risk.
- (i) Development costs, such as unusual, abnormal or extraordinary conditions: changes, reconstruction, obstructions, interferences, grading, extra cost of doing work while maintaining operation.

#### **3. Overhead Costs:**

- (a) Interest during construction.
- (b) Taxes during construction.

#### **4. Cost Preliminary to Construction:**

- (a) Preliminary expenses: organization, administration, engineering, legal, financial.
- (b) Charter and franchise costs and fees: including permits, consents and expenses of compliance with requirements.

(c) Promotion costs and services: reports, engineering, surveys, interesting bankers, investors and local authorities.

(d) Financial costs: commissions to brokers and to underwriters, cost of preparing and marketing securities.

**5. Superseded Property Cost not yet Amortized.**

**6. Going Concern Cost:**

(a) Cost of reproducing the earnings.

(b) Cost of creating, developing and attaching business, advertising, soliciting, concessions, furnishing service or equipment free or below cost, securing customers.

(c) Costs of deficits in earnings, operating losses from strikes, fuel, shortages, etc., legitimate expenses to avoid uneconomic competition and to increase net earnings per dollar of investment.

**7. Additions under Way or Necessary to Provide Adequate Spare or Reserve Plant or to Properly Handle Future Business.**

**8. Cash Working Capital:**

(a) Cash: bank deposits and cash on hand.

(b) Credit balances.

(c) Investments: (if necessary and not fully self-carrying).

(d) Reserves: insurance, pension, etc.

(e) Deposits: (if required as surety by city, etc.).

**Construction Schedule.**—In order to make an estimate of the cost of reproduction, it is necessary to formulate a rational program upon which it may be assumed that a given property may be built up along the lines of a definite and practicable schedule. The property to be reproduced is considered as non-existent, and all steps necessary to produce the existing property must be assumed to be gone through with in order to obtain the same results as exist in the actual property under consideration. The argument that an estimate of the cost of reproduction is based on an instantaneous recreation is illogical and misleading. Such conception originated in the minds of theorists rather than practical constructionists.

**Inventory.**—In determining the value of property, unless book values are accepted, an inventory of the structural parts is first necessary. As the inventory will be the basis of the entire valuation, it must be completed with much detail and great care in order to secure reliable results. Within the limits of the time usually allowable, and having regard for the expense of the work and the liability of error on the part of the ordinary employee, it is practically impossible to make a complete in-

ventory of existing property. Experience shows, that even with the most thorough work and constant checking, the quantities listed will be less than the actual amounts existing.

For purposes of verification and in order to comply with court requirements, it is necessary to make a detailed inventory, set up in exhaustive tabulations, of the property being appraised. This is essential, although the labor and cost involved may seem excessive and unwarranted, but is demanded as the one tangible element to which all other elements or estimates of the appraisal are definitely tied. The inventory, when priced, should, on its face, clearly indicate the methods, quantities, unit prices, with each overhead percentage, consecutively leading up to sub-totals and finally the grand total of the completed appraisal.

In the making of an appraisal, nothing is more important than a carefully prepared, accurate, complete, and reliable inventory. For suggestions as to the lines to be followed for convenient pricing, the proper division and classification of the inventory, and other general discussions of the subject, the reader is referred to Chapter IV of the author's "Valuation of Public Utility Properties."

**Unit Prices.**—For the completion of the appraisal, the unit prices to be used must be carefully determined. These prices can usually be fixed without much difficulty, if the basis of the prices is clearly understood and held constantly in mind. The weight of the best opinion at present holds that the cost of reproduction is based on present prices, consequently while it is necessary to examine bills, vouchers, contracts, minute books, and other records of the corporation to obtain information as to type and class of property under construction, and the knowledge of actual costs in the past, such costs must be recast after an investigation of present local conditions, and a consideration of present-day quotations and costs, in order to fix present fair prices. As unit prices are based upon facts, there should be no difficulty in determining proper unit prices for any particular case, where the necessary amount of detailed labor is performed in collecting the information necessary upon which to base conclusions. There is, however, apt to develop a greater difference in the final values of property as determined by different engineers, due to their use of different percentage allowances required to cover the omissions, incidentals and contingencies and other additions hereinafter discussed. These



differences arise from the varying knowledge and experience of the individuals determining the percentages applied, and such differences may always be expected, although not thereby prejudicing or discrediting the results, except in so far as the standing or experience of the party fixing such percentages may be prejudiced or discredited.

The making up of unit prices in any specific case will depend upon:

(a) The local conditions, as for example, character of soil in which the excavation is to be made, accessibility for the delivery of parts shipped in, conditions of the available labor market both as to quality and supply, and similar local characteristics.

(b) The source and character of the information on which the figures making up the unit prices are based. The information will vary from mere hearsay to exact figures obtained for similar work under similar conditions, and the dependence to be placed on the source of information must be duly considered and weighed.

(c) The refinement to be used in making up unit prices. In some cases an average figure, based on proper experience and judgment, may prove as satisfactory as a figure laboriously worked out from a mass of varying data. There is always opportunity for abbreviating the work by due consideration of this matter by a competent expert.

(d) The relation of the unit price to the percentages to be added later.

(e) Whether or not depreciation is to be allowed in the unit price (not usually done).

(f) Whether the unit price applies to the raw material or the finished product. For example, the purchase of a given number of yards of sand, concrete and stone results in the production of a yardage of concrete quite different from the sum of the yards of the three constituents.

(g) Whether the unit price includes the cost of the labor, material, supervision, administration expense, and incidentals or whether these items are to be kept separate.

In order to obtain a total fair value of property, it is of course essential to apply fair unit prices to the elements contained in the completed inventory. Two unit prices, both fair, and yet quite different in value, might be used; one, the higher,

would include certain allowances which the other would not include, because added later as a percentage of the total net cost. As will be seen, the first method endeavors to fix the total cost, to the corporation, of the item being considered, completely installed, including all allowances, but the second method, one which is now much in vogue, endeavors to ascertain the exact price for each item bought separately, then to add to the net valuation, obtained by applying such unit prices to the inventory, definite percentages to cover first, an allowance that would have to be paid a general contractor for doing the work of assembling and unifying the elemental parts, and second, an allowance to cover engineering, administration expenses, contingencies and omissions, etc.

**Fluctuating Prices.**—While there is some difference of opinion as to whether unit prices of items, which fluctuate widely in cost, should be based precisely upon those current at the time of the appraisal, or whether averaged prices, extending over a period of years should be used, the more generally accepted method is to equalize the fluctuations on the ground that a constant rather than a momentary valuation of utility property is desired. In some instances, the varying prices within a period previous to the date of the appraisal, have been averaged and adopted. A common and customary practice is to assume a period of five years, obtaining the average price of labor and materials during such period. Where there is a tendency toward higher or lower prices, such tendencies are sometimes considered, when the cost at the time of the inquiry may be adopted as more nearly representing fair average conditions. As the purpose of valuation is to ascertain fair present value, fairness must be applied in determining current prices. The price of real estate may have been rising rapidly for a period of years, and the use of an average figure for the preceding five years would be manifestly unfair. In the same way, the uniform tendency of the cost of lumber to rise, makes the present price fairer to the recently constructed utility than the average price. In the same way, the uniformly decreasing cost of steam turbines or certain electrical apparatus might make the use of the average price in place of the present price unfair to the public, so that the adoption of average prices based on the average of fluctuating prices over a period of years, must be used with caution and discretion.

**Contractor's Profit.**—Where unit prices have been made up upon the basis of raw materials or apparatus simply delivered at their destination, and labor has been put in upon the basis of wages paid workmen, it is quite customary to add a certain percentage to cover the charges for a contractor's services and expenses. It is, of course, impossible to use labor in putting raw materials together without necessary supervision, which is charged for under the term "contractor's profit." Sometimes this percentage is added to the cost after applying unit prices to the inventory, but quite often the allowance for contractor's profit is added to the unit price itself before application to the inventory, so that no such percentage or allowance is apparent in the final valuation tabulation. This difference of procedure has caused a large amount of misunderstanding and controversy as to what is fair and customary, or what allowances have been made by engineers or public authorities in fixing values of property. It may be said that practically without exception, an allowance to cover the contractor's expenses and services has been included even in what is shown as the "bare bones" cost of the structural property, in all valuations of impartial, intelligent public authorities that set up no separate allowances for "contractor's profits," unless the work is assumed to be done by Company forces and a different unit price adopted. The allowance for the contractor will vary from 5 per cent. to 15 or 20 per cent. upon the cost of labor and materials furnished under his supervision. In some instances the percentage on labor will be different from that on material, for example, 10 per cent. on material and 15 per cent. on labor has been a common allowance where contractors are working on a "time and material basis," that is, where the owner assumes the risk, and the contractor furnishes simply his services and his own incidental costs. Where the contractor assumes the risk of completing the entire work, in large undertakings he will often figure from 20 to 50 per cent. additional to the costs to him of completing the property, the percentage varying by reason of the liability to accident, definiteness of contract, keenness of competition, and other local conditions.

**Engineering, Architects' Fees, etc.**—It is quite customary, and usually proper and necessary for engineers, architects, or other qualified experts, to be employed to supervise and design the construction of any large property. The charge for such services

is ordinarily based on the cost of the work supervised; consequently it has become an accepted rule in valuation work, to add a general percentage to the "general contractor's cost," or the base cost "of the physical property," to cover the services and expenses of the engineer or architect. Sometimes, as is done by the Wisconsin Commission, a single percentage covering engineering, contingencies, omissions, and other less important items is added, but this is usually not as satisfactory or as accurate as determining the proper percentage for each of these elements of cost, and allowing therefor separately. The reason for this is that the percentages are applicable to and vary with the different elements of property, and an attempt to apply a single percentage results in confusion and controversy. For example, the same percentage applied to the unit cost of real estate, with the purchase of which an engineer or architect usually has little to do, makes it appear as if a percentage was being unfairly allowed and added, necessitating an explanation. However, a proper, averaged percentage can usually be sustained on the ground that while inapplicable to certain items, because too high, yet it is too low for other items, and hence its general application to all items results in adding only the proper amount in fixing the value of the whole property. The usual engineer's and architect's fees vary from 5 per cent. to 10 per cent., in some instances running even higher. Five per cent. has been quite generally accepted as the proper engineering cost, based on actual charges made by engineers, and upon records of similar costs where kept accurately and fully.

**Omissions, Incidentals, and Contingencies.**—In order to compensate for these several items, it is considered proper, and has become generally customary to add a small percentage, from 1 to 10 per cent., to the sub-totals in the inventory, after adding unit prices. Considering the allowances made separately for each class, that for omissions is usually from 2 per cent. to 5 per cent., varying with the thoroughness with which the work has been carried out. Aside from omissions, there are always a large number of small items which cannot be included separately in inventory, on account of the labor and expense involved in exactly ascertaining what they are, and listing them. These small items are usually called incidentals, and like omissions, are allowed for by adding a small percentage, depending on the minuteness of the inventory, to cover such items. The per-

centage allowed for incidentals will vary from  $\frac{1}{2}$  per cent. to 5 or 6 per cent., and is usually taken at from 3 to 5 per cent. In addition to omissions and incidentals, the item of contingencies must be taken into account in the inventory. Contingencies are determined from a consideration of the particular property, and type of construction under consideration. Actual quantities measured in place always overrun the theoretical quantities required, due to loss, wastage, shrinkage, calamities, ordinary human liability to error, and the impossibility of constructing property with geometrical exactness. In the construction of practically all physical properties, the elements must be taken into account, and the losses they cause recognized and allowed in the valuation. In building a dam, floods are almost certain to wash away material, and even parts of completed construction; the actual weight of cast-iron pipe and metal work must run in excess of the specifications in order to avoid penalties. Earth work compacted in place is much less than the yardage of loose material moved; necessities of construction work require temporary structures, or the taking down and rebuilding of certain parts. The allowances for contingencies may be covered in part by a knowledge of the history of the property being considered, including records as to conditions and costs of construction. Where such knowledge is not obtainable, experience in similar work must be the guide, but in every case the contingencies should be covered by a percentage allowance added to the value of the inventoried property, varying from 3 per cent. to much larger amounts, depending on the class of property and the knowledge of the liability for contingency under the necessary conditions of construction.

**Insurance.**—The recent and general agitation for the protection of both the public and employees against accidents, together with the many "compensation laws" being passed by state legislatures, have resulted in making the item of insurance a very appreciable one, in comparison with the various other expenditures incurred in completing a public utility property. In many early appraisals the cost of insurance was so small as generally to be included with other incidentals in a common percentage, but the many classes of insurance now required, namely, that against injury to the public and employees, damage from fire, flood and tornadoes, guarantees for the protection of property against accident, against failure to complete on time, and similar matters, have compelled recognition

of a separate allowance to cover specifically insurance of all kinds. The amount to be allowed for insurance will depend upon the location and character of the construction work undertaken. The risk of injury to individuals is, for example, much greater in the construction of an underground electric trolley road in the streets of New York City than in construction of steam railroads across the open country, and the insurance rate will correspondingly differ. The liability to damage from fire is, of course, much greater in a building constructed of wood than one of concrete and steel. In some places tornadoes are unknown, while in other sections of the country they are relatively common occurrences; on some streams sudden and heavy floods are to be expected, on other streams they are unusual, so that the proper amount to allow for insurance in the construction of any given property is determined from a consideration of local conditions and the risks involved. Expressed in a percentage, the expenditures for insurance, reasonably necessary in the construction of utility property, will seldom be found to be less than one-half of 1 per cent. of the cost of the physical property, and under extreme conditions may amount to as much as 4 or 5 per cent.

**Development Costs.**—With regard to property constructed under conditions other than those which now exist, it may be necessary to include under "development costs" the expense incurred in creating existing conditions. For example, in the construction of the underground trolley roads in New York City, it was necessary to remove from the center to the side of the street gas pipes, water mains, and other obstructions, so that, at present, the rights-of-way on which the tracks are laid are free and clear. The cost of reproducing the existing property, without taking into account the former obstructions in the cleared rights-of-way, would not adequately represent the value of the existing property, and, therefore, the cost of clearing the obstructions must be included as a "development cost." Similarly, street grades may have been changed, fillings made, temporary constructions installed, such as coffer-dams, work buildings and the like, or unusual conditions may exist which, not apparent on first sight, nevertheless require consideration, and proper recognition.

**Interest.**—The interest charges accumulating on capital expended during the construction of utility property properly becomes a part of the capital investment. This principle is

practically universally conceded both by public service commissions and the courts:

"No case has been cited, and in our investigation we have found no case involving this question, where a reasonable amount has not been considered and allowed for loss of interest during construction, as a part of the cost of construction."<sup>1</sup>

Opinions differ as to the proper annual rate of interest to be allowed but this will, of course, vary, due to local conditions and the difference in the normal rate of interest prevailing in different sections of the country. The usual procedure is to allow the full interest rate, for half the construction period, on the total cost of the property, or, what amounts to the same thing, half the interest rate, for the entire period of construction.

It has been claimed, with justification, that the rate of interest allowed should be the same as the rate of return allowed, on the ground that the investors should not be limited merely to the legal rate of interest during the construction period any more than during the remainder of the life of their property. Another important consideration in determining the allowance for interest, is whether it may be assumed that cash will be advanced by the stockholders or bankers, as representative of the bondholders, in such amounts as may be required from month to month to meet construction accounts falling due, or whether practically the whole amount of money required for construction will be paid in, at or about the time construction begins. In the case of properties costing relatively small amounts, say less than \$500,000, it is seldom that any particular advantage can be obtained by attempting to distribute the payments of capital in accordance with construction requirements, and even in the case of very much larger properties the same still holds true. This is well illustrated by what has taken place recently, in New York City, in connection with the securing of money by the Brooklyn Rapid Transit Company for the construction of subways. It became necessary for this company to borrow \$40,000,000 with which to carry out its constructions. It did not expect to be able to expend more than about \$17,000,000 in any one year; nevertheless, on Oct. 1, 1912, it obtained the whole \$40,000,000, having to pay therefor interest at the rate of 6 per cent. It placed this money in the bank, obtaining therefor 3 per cent. interest, and claimed the right to

<sup>1</sup> Pioneer Telephone & Telegraph Co. vs. Westenhaver, 118 Pac. 354.

charge the difference, 3 per cent. on \$40,000,000, as part of the cost of plant construction. One of the Directors of the Transit Company, in a reported interview, explained the matter as follows:

"He pointed out that the B. R. T. had acted according to good business policy in borrowing \$40,000,000 on Oct. 1, last. He said that the only way that the company would be sure of having the money when it needed it, even if the need should come several years hence, was to borrow it then altogether when the rates were easy. If it were to go into the money market now it would have a much harder time of it, he said."<sup>1</sup>

**Taxes.**—Taxes that accrue during construction of utility property, like interest, are considered a part of the capital investment. They are sometimes allowed as a percentage, charged the same as interest, but a fairer and more exact method is to base the allowance upon estimates made up from a consideration of the taxes actually being paid, itemizing real estate taxes from Federal or revenue and other taxes. The Public Service Commission of New York, First District, in its instructions contained in its "uniform system of accounts for electrical corporations" provides, on page 18, item E284, the following:

"Charge to this account all taxes and assessments levied and paid on property belonging to the corporation while under construction and before the plant is opened for commercial operation, except special taxes assessed for street and other improvements, such as grading, sewerage, curbing, guttering, paving, sidewalks, etc., which shall be charged to the account to which the property benefited is charged."

**Preliminary Expenses.**—Closely related to the work of the promoter are the expenses incurred in the creation, organization and starting of a utility corporation. In addition to the legal work involved in obtaining, perfecting and approving franchises or consents of public authorities engineering estimates must be checked and approved, financial prospects of revenues and earnings recast and certified, arrangements for financing completed, the formation of a working organization instituted and general plans completed for carrying out the construction and operation of the property for which the corporation has been originated.

Preliminary expenses will vary with the type and character of the utility being considered, and under normal conditions these expenses will amount to from 1½ to as high as 10 or 15

<sup>1</sup> *New York Sun*, Dec. 14, 1912.



per cent. of the cost of those physical properties which eventually prove successes. Of course, money expended for preliminary work is entirely lost in those corporations which never complete their physical properties, or if completed prove to be financial failures.

**Promotion.**—The services and expenses of those engaged in originating and getting a utility property "on its feet" are generally recognized and allowed as a part of the capital cost. The report of the Railroad Securities Commission, consisting of Arthur T. Hadley, Frederick N. Judson, Frederick Strauss, Walter L. Fisher and B. H. Meyer, to President Taft, at page 30, under the head of "Promoter's Profits and Services," says:

"We are told that the profit of the promoter represents a wholly unnecessary burden upon the American public, and that so far as this profit can be done away with it will be good for all parties. Neither of these statements is quite true. The promoters, using the term in a broad sense, may be divided into two classes: constructors who build a road whose future is uncertain, in the expectation of selling the stock for more than it costs them; and financiers who induce the public to buy the bonds of such roads. Both of these classes, if they do their work honestly, render useful services to the public. The constructor gives our undeveloped districts the benefit of new roads, which they would not get without his intervention; and if he does his business well he builds the road more economically than anybody else could. The financier renders an equally important service in collecting the capital of the investors to build new railroads or improve old ones."

The public service commissions have very generally recognized the value of the services of the promoter, although some hold that his reward should be given by allowing a larger rate of return rather than by a lump sum included in the capital account. The courts have also recognized the legitimacy of the promoter's services; in one case referring to such services in effecting the consolidation of numerous independent railroad properties into what is now known as the Southern Railroad System, the Court said:

"This enterprise is a perfectly legitimate one. The men who have received and executed it are entitled to a fair return upon the money which has been actually invested in it. They are entitled, in addition, to a reasonable profit upon the ability to conceive and execute a project of this sort."<sup>1</sup>

<sup>1</sup> *City of Danville et al. vs. Southern Ry. Co.*, 8 I. C. C. R. 409, 438.

In contracts between municipalities and utility corporations, payment for the promoter's services, either in constructing the property or procuring funds, has frequently been recognized. In the existing contracts between the City of Chicago and the Traction Companies there is a clause which recites that 5 per cent. "shall be paid for the Company's services in procuring funds therefor, including brokerage."

The English courts have recognized the necessity for remunerating the promoter, saying:

"In other words, we must either refuse to follow the formula approved by the House of Lords and agreed to by the parties, or find, as a fact, that money can be procured for nothing."<sup>1</sup>

The public service commissions have, in some instances, used 5 per cent. to cover the expenses and services of the promoter. In the case of the Central California Gas Co., the Railroad Commission of California allowed \$12,000, being:

"\$1,000 per month for the 12 months during the organization period."<sup>2</sup>

A more recent decision by the same Commission, Decision No. 1075, decided Nov. 11, 1913, in the case of the San Rafael & San Anselmo Valley Railway Co., page 6, approves \$2,500 in stock, \$1,700 in bonds and \$5,000 in cash, in all \$9,200, to the promoter of a projected railway applying for issuance of stock and bonds aggregating \$97,379.92, revised estimate of cost of the project. This would be allowing in bonds and cash \$6,700, or 7 per cent. of the total cost of the project. If we consider the stock as worth 50 cts. on the dollar, the total allowance for promoter's services would be \$7,950, and this is 8 per cent. of \$97,379. Figuring stock at par the fee amounts to nearly 10 per cent.

**Financial Costs.**—In order to raise money for any corporation, either through the sale of stock or bonds, more or less expense is necessarily incurred. From the standpoint of public utility regulation it is immaterial from what source the money may come which is invested in property used for serving the public. The fair return allowed is based upon the value of the property. If the money necessary to create this value may be raised entirely

<sup>1</sup> National Telephone Company, Limited, vs. H. M. Postmaster, General Decision by Judge Lawrence, 1913.

<sup>2</sup> Volume 2, page 116, California Decisions.

through the sale of stock which in that case will require certain outlay in order to dispose of the stock, or the money may be raised partly through the sale of stock and partly through the sale of bonds, in which latter case some of the expense of marketing stock will be saved as compared with the condition of raising all money through the sale of stock, but on the other hand new expenses are incurred in disposing of bonds. This latter expense is usually brokerage and is paid to bond houses for their services and expenses in marketing bonds. In either case these financial expenses are a legitimate part of the cost of creating the property just as much as the charges for legal or engineering services, or the purchase of physical plant. Naturally the cost of financing will vary with the character and reputation of the utility being considered, but will rarely be found to be less than  $2\frac{1}{2}$  per cent., and may amount to 10 or 15 per cent. of the face value of the securities sold.

**Overhead Charges.**—The term “overhead charges” is frequently used in a loose way to indicate all allowances of an intangible nature added to the purely physical costs in estimating the total appraisal. Such use of the term may, but more usually does not, include the allowance for the contractor’s or sub-contractor’s services and expenses. In its broadest use it does include engineering, omissions, incidentals, contingencies, insurance, interest and taxes during construction, costs of financing, administration expenses preliminary to and during construction, as well as for promoter’s charges, if allowed. Although not usually so, overhead charges are sometimes taken to include going value and franchise value.

The allowance of 12 or 15 per cent. to cover overhead charges, made by the Railroad Commission of Wisconsin, has been made the basis of a similar percentage allowance by other commissions without appreciation of the basis on which unit costs are made up by the Wisconsin Commission. Where unit prices do not include anything for contractor’s profit, insurance, administration expenses during construction, contingencies, incidentals and other such items, the addition of 12 or 15 per cent. is not usually sufficient to cover all proper overhead charges. That this is the conclusion of the Wisconsin Commission itself is shown by such statements as the following, made in connection with the testimony of two contractors who testified as to the necessity for larger overhead allowances than those made by the Commission:

"While their testimony throws some light on the situation, their figures apply to the overhead charges of their own contracts, rather than to the allowance which should be added to the estimates of the Commission's engineers. Both of these contractors have installed equipment for the respondent company and the figures used by the staff include in the unit price the overhead referred to; for example, the price used for a holder is the price of the unit in place. This price covers design, material, shop and installation labor, freight, various overhead charges, and profit. The overhead here included is the overhead to which the witnesses referred and is different from the additional percentage which must be added to the cost of this holder to cover the indirect expense which the purchaser must incur. What has been said in regard to holders applies, to a large extent at least, to retort house equipment, condensing and purifying apparatus, water-gas machinery, coal-handling apparatus, etc.; in fact, to all equipment which is customarily furnished erected in place by the manufacturer or contractor. In all such cases, the prices used by the staff are intended to cover the reasonable value of this equipment as erected. The testimony of these witnesses, however, shows that a good deal of the engineering is done by the contractor and that on a considerable portion of the property under consideration the contractor assumes the risks of installation. This would tend to decrease the allowance necessary for use of tools, contingencies, insurance and damages, omissions, etc."<sup>1</sup>

From the preceding it will be recognized that where the Railroad Commission of Wisconsin takes "the price of the unit in place," which price necessarily includes all the overhead charges added by the contractor to his cost of labor and material, and adds to that contract price 12 or 15 per cent., the Wisconsin Commission has thereby allowed somewhere between 20 and 50 per cent. above the unit price that would be used, for example, by the Public Service Commission of New York City, at least on the basis of costs used by the latter during the time that the writer was doing work for the Commission. This will explain why some commissions, including New York, basing their unit prices more nearly on labor and material costs, add larger percentages than 12 or 15 per cent. to cover the so-called overhead items of the Wisconsin Commission.

The Public Service Commission of New York, First District, in the Queens Borough Gas & Electric Company case, made allowances, to show which the following table is here given:

<sup>1</sup> City of Milwaukee vs. Milwaukee Gas Light Co., 12, W. R. C. R., page 445.

TABLE II

Queens Borough case	Gas dept.	Electric dept.	Total
Net cost of property other than land	\$707,815	\$637,724	\$1,345,539
C. P., eng., admin., cont., and incidentals.....	136,345	126,608	262,953
Per cent. allowed.....	19.25	19.85	19.55

It is distinctly stated in the opinion that the above valuation of \$1,345,539 contains sub-contractor's profits. It is seen that, in addition to such sub-contractor's profits, there was allowed in this case for general contractor's profits, engineering, administration, contingencies and incidentals, \$262,953. This is 19.5 per cent. of the net cost of the property, other than land. But, in addition to this, there was allowed, besides \$75,000 for working capital, the sum of \$220,000 for "preliminary and development expenses." This is 16.3 per cent. of the net cost of the property other than land. Hence, there was allowed here for overhead charges, including the contractor's services and expenses, 35.8 per cent. of the cost of all of the property, aside from land, before it was depreciated, and this cost is in addition to the allowance for sub-contractor's profits. Had the allowances been made upon the depreciated property it would have amounted to 55 per cent. of such property, over and above the sub-contractor's fee, as is seen by subtracting from \$1,345,539 the sum of \$468,680, leaving \$876,859, and of this sum \$482,953 is 55 per cent. These allowances do not include any allowance for going value.

In another similar case of the Brooklyn Borough Gas Company, the Commission allowed \$202,201, that is, 24.1 per cent. of the net cost of the property other than land, "for general engineering supervision, administration expenses, contingencies, incidentals and general contractor's profit," in addition to \$180,000, or 21.5 per cent., for preliminary and development cost. The sum of these two percentages is 45.6 per cent. added to the cost of the property new, aside from land, for overheads.

In another case, in Kings County Lighting Company, where the cost new of the property, outside of land, was placed at \$1,561,628, \$260,000 or 16.7 per cent. was allowed for "preliminary and development expenses," and \$341,149 or 20.8 per cent. for contractor's profit, engineering, etc., a total of 35.7 per cent. for overheads. These figures are shown in detail in the following table:

TABLE III.—COMPARISON OF OVERHEADS ALLOWED BY NEW YORK COMMISSION, FIRST DISTRICT

	Queens Borough Gas & Elec. Co.	Kings County Lighting Co.	Brooklyn Borough Gas Co.
Net cost of property other than land.....	\$1,345,539 = 100.0 %	\$1,561,628 = 100.0 %	\$838,154 = 100.0 %
Contractor's profit, engineering, administration, contingencies and incidentals.....	262,953 = 19.5 %	341,149 = 21.8 %	202,201 = 24.1 %
Preliminary and development.....	220,000 = 16.3 %	260,000 = 16.7 %	180,000 = 21.5 %
(A) Total.....	\$482,953 = 35.8 %	\$601,149 = 38.5 %	\$382,201 = 45.6 %
Working capital.....	75,000 = 5.6 %	80,000 = 5.1 %	40,000 = 4.8 %
(B) Total.....	\$557,953 = 41.4 %	\$681,149 = 43.6 %	\$422,201 = 50.4 %

A recent decision has been rendered by the New York Public Service Commission, First District, in re Bronx Gas & Electric Company, which exhaustively reviews the overhead allowances previously made by the Commission, and in fixing the value of the property of the company named, allows in said valuation 2 per cent. of the value of the physical property for incomplete inventory, 20 per cent. on the sum of the two preceding amounts, for engineering, supervising, contractor's profit, contingencies and incidentals, plus 12 per cent. for preliminary and development expenses. The detailed figures of the appraisal are as follows:

## BRONX GAS &amp; ELECTRIC COMPANY

	Total gas and electric net reproduction cost (exclusive of real estate).....	Per cent.
	\$785,508.44	= 100.0
Incomplete inventory.....	15,710.17	= 2.0
Additions for other overheads.....	160,243.71	= 20.4
Preliminary and development expenses....	107,020.68 <sup>1</sup>	= 13.6
Total overheads.....	\$282,974.56	= 36.0
Working capital (excess of current assets over liabilities).....	45,032.41	= 5.7

One of the most important and widely discussed decisions of any public utility commission is that rendered by the Board of Utility Commissioners of New Jersey in the Passaic gas rate case. The subject of overhead costs and going value was thoroughly considered and fully disclosed, and the allowances therefor have

<sup>1</sup> Based on an allowance of 12 per cent. upon the depreciated value of the physical property plus the appraised value of the real estate.

been considered and approved by the Supreme Court and the Court of Errors and Appeals of New Jersey. On the following page is given a table summarizing the detail of findings and allowances made by the Commission. From this table it will be seen that the allowance made for all overheads, including going value, was 51.45 per cent. of the net cost, to reproduce the plant new, in addition to and on top of the allowances made for reward to the contractor, covered in the unit values adopted for the physical property, before the 51.45 per cent. was added.

TABLE IV.—GENERAL SUMMARY OF COMMISSION FINDINGS

Passaic, N. J.—Public Service Gas Company. Board of Public Utility Commissioners, N. J. Order Fixing Rate—Decided December 26, 1912.

Land (at appraisal value plus 10 per cent. on about 70 per cent. of total for "plottage" or "assembly" value, i.e., 7 per cent. on land total)..... \$ 111,160.00

Organization; franchises; patent rights; other intangible gas capital; cost of establishing business; law expenses during construction. 1,025,000.00

Manufacturing plant  $\times 1.176$   
(plus 17.6 per cent.)..... = \$1,161,550

Distribution system  $\times 1.176$ ... = 2,465,270  
\$3,626,820

Less 3 months' construction to  
bring appraisal to 7/1/11..... 62,000  
\$3,564,820

which is made up of

Net cost of structure..... \$3,030,612.00  
and 17.6 per cent. thereof for:

	Per cent.
Engineering and supervision.....	5.0
Omissions.....	2.0
Contingencies.....	2.0
Organization, liability, taxes.....	2.0
	11.0

Interest at 6 per cent. on 1.11 per cent. 6.6  
17.6

Working capital..... 534,208.00

Total—new..... 250,000.00

Total—new..... \$4,950,980.00

Accrued depreciation deducted..... 200,980.00

"Present Value"..... \$4,750,000.00

$\frac{1,025,000 + 534,208}{3,030,612} = \frac{1,559,208}{3,030,612} = 51.45$  per cent. net cost to re-

produce new.

(This 51.45 per cent., total overhead is exclusive of \$7,500 already included for land "plottage.")

**Superseded Plant.**—Probably, on a strictly reproduction basis, superseded plant should not be included in the present value of existing property; certainly not, provided accurate estimates of the rate of depreciation had been made and allowances for the accumulation of necessary depreciation reserves had been provided in the rate of return allowed. As a matter of fact, estimates as to the rate of depreciation in the future are at best merely intelligent guesses based on the widest information and experience available. Such estimates being forecasts of the future are necessarily imperfect, so that even where earnings might be sufficient to provide reserve funds, such funds may not have been accumulated because of erroneous estimates as to the rate of depreciation. In many instances earnings have not been sufficient to provide depreciation reserves in large enough amounts to take care of rapidly accruing depreciation, so that it has not been possible to write off the superseded property. Under such conditions courts and commissions have recognized the principle that in fixing rates, allowances should be made in some form for the loss sustained because of such superseded property. Sometimes this loss may be included in "going value," particularly where such item is estimated from a consideration of the cost of building up the business. Where rates have not been sufficient to pay all fair operating charges, a fair return upon the value of the property and take care of depreciation, the value of superseded property may fairly be included in the amount used as the basis in fixing the fair return.

The Municipal Commission of Milwaukee, Wis., in one important case, where it found the value of the local utility property to amount to about \$5,000,000 on the basis of reproduction cost, excluding all value of superseded plant, the Court of Appeals set aside the order of the Commission on the ground that at least \$2,000,000, or 40 per cent. additional, should have been included as representing cost of plant which had disappeared from the present inventory:

"I am satisfied that the property of complainant represents a value, based solely upon the cost of reproduction, exceeding \$5,000,000. And I am further satisfied that this amount is not the true measure of the value of the investment in the enterprise." . . . "Of the \$5,000,000 and over paid for the acquisition of the old lines, it would be difficult, if not impossible, from the testimony to arrive at any fair approximation of the share or amount of tangible property which



enters into the valuation in this inventory. It does appear that the roadways require reconstruction with new rails and paving, and that the amount stated was actually paid by the investors, making their investment nearly \$9,000,000. How much of this may be defined or apportioned as the amount which was both 'really and necessarily invested in the enterprise' (*vide Road Co. v. Sandford, supra*), I have not attempted to ascertain, except to this extent: that I am clearly of opinion that at least \$2,000,000 of these preliminary expenditures are entitled to equitable consideration, as so invested, beyond the reproduction value, if the valuation of the investment is not otherwise found sufficient for all purposes of this case."<sup>1</sup>

"It is not always reasonable to cast the entire burden of depreciation on those who have invested their money in railroads."<sup>2</sup>

The principle enforced by the court on the commission, in the above case is well illustrated in the appraisal of the Chicago Consolidated Traction Company's property in 1910, where an allowance was made for overhead charges of over 38 per cent. and in addition to this they allowed several millions for franchise value for an old cable road which was in disuse and which was immediately pulled up and thrown away, and on top of those old properties that were out of date, they capitalized the total cost of the new property, so that in fact this Chicago property now has perhaps 60 per cent. added to it.

The St. Louis Public Service Commission, in the case of the *Union Electric Light & Power Company*, evidently included the cost of a certain amount of "superseded property" in its allowance for "established business," for, after referring to "going value" as identical with the cost of "establishing the business," the Commission adds:

"The Commission is endeavoring to arrive at a fair value of the property at present in the service of the public and does not consider that abandoned property enters into the calculation except so far as it effects the *cost of establishing the business*, for which item allowance has already been made."

<sup>1</sup> *Milwaukee Electric Railway & Light Co. vs. City of Milwaukee*, 87 Fed. 577, 585.

<sup>2</sup> *Ames vs. Union Pac. Ry. Co.*, 64 Fed. 178.

## CHAPTER VI

### LAND, PAVING, AND WATER RIGHTS

**Land Values.**—There has recently developed considerable opposition to permitting utilities to have the unearned increment arising from appreciation in land value. If the investor were guaranteed under all circumstances a fair return on his property, there might be some merit in the argument, that he is not entitled to profits from the unearned increment, but such conditions do not now, and certainly will not obtain in this country, in the near future, consequently valuations of existing utilities proposed to be based on such premises are impracticable. Heretofore investors in utility properties have been encouraged to believe they would be allowed any profits accruing from rise in land values. If investors are to be allowed none of the chances for gain under advantageous circumstances, and must stand those losses accruing from disadvantageous conditions, the rate of return to be allowed must be increased, but the higher courts have never given any intimation of recognizing anything but present value in consideration of land value. If the utility investing in real estate were not to be allowed the unearned increment, the same result would probably be attained by some circuitous method, such as ownership by individuals leasing the required real estate to the utility at regularly increasing rates, corresponding to the present value of the land, so that, in any case, the public would pay a fair return on the present value of the land.

The question has been raised that as depreciation of buildings, for example, is a charge against operation: why should not the appreciation of land be a credit?

The answer has been well stated by Mr. C. P. Howard:

“The funds provided for depreciation are a part of the general expense of running the business—maintenance, repairs, and replacements. Replacements are, in a way, simply maintenance and repairs on a large scale, and at longer intervals. Depreciation funds take care of replacements. The appreciation of land is entirely different. It

has no necessary and direct connection with operation, or with the special use made of any particular piece of land. In a general way, of course, all industries in the community contribute to it. All other owners of property enjoy this increase as a clear bonus; the unearned increment."<sup>1</sup>

We have never heard of any other attempt than that of the Public Service Commission of New York, First District, to deny, in the face of Supreme Court decisions, that the increment in the value of real estate was a part of the utility capital upon which returns must be allowed. In the decision referred to, the Commission said:

"The present fair value of the real estate has been found from the evidence presented in this case. The difference is the increase between the date of purchase and Dec. 31, 1910. The average annual increase is found by a simple mathematical calculation, similar to that used for fixing annual depreciation. The result is practically \$35,000."<sup>2</sup>

This average annual increase in real estate value as found in the Kings County case was treated as a part of the annual revenue, and made a part of the total revenues to be allowed the company in fixing rates for a fair return. This action of the Public Service Commission was appealed by the Kings County Lighting Company, first to the Supreme Court and then to the Court of Appeals of New York State, the particular point involved being certified to for review, namely:

"Was the Commission entitled, upon the facts shown in the record, in ascertaining the amount which should constitute a proper return, to consider as part of what accrues to the relator as gross receipts of its yearly operations, the annual appreciation in the value of its land?"

Both of the Courts appealed to decided against the Commission, holding in accordance with the Supreme Court's previous decisions that the present value of real estate is a part of the property on which the public must pay a fair return.

While, therefore, public regulation may in some way prevent utilities from hereafter obtaining the benefit of future increment in land values, up to the present time such increment belongs to the owners, whether they are corporations or individuals.

"There must be a fair return upon the reasonable value of the property at the time it is being used for the public."<sup>3</sup>

<sup>1</sup> *Proceedings of the American Society of Civil Engineers*, February, 1914, Vol. XL, No. 2, page 9387.

<sup>2</sup> *Reports of Public Service Commission of New York, First District*, Vol. II, page 705.

<sup>3</sup> *Wilcox vs. Consolidated Gas Company*, 212 U. S. 41.

"As to the justice of the allowance of the so-called unearned increment there is a wide divergence of opinion. The pioneer goes out into the forest, and by his detriment of time, labor and privation builds a home. Others follow, and by joint efforts a community is established where once the forest stood. The property of the original settler has now become valuable, and the enhanced value over the actual cost and expenditure of the settler we call the 'unearned increment.' The term 'unearned' is a misnomer, for the enhanced value has been fairly earned by years of labor and deprivation. The man who finally reaps the harvest may not be the same individual who sowed the seed. The pioneer may not be able to await the day of the harvest, but if he does, no man will say that the harvest is not rightfully his, or that it has not been fairly earned.

"So too does the railway company project its line into new territory with a full knowledge of the detriments to be overcome. The company considers from the beginning that no adequate return will be made during the early years of its history, but, like the pioneer, it helps to build up a new territory, with confidence that an increment will result sufficient to more than cover the detriment in loss of returns or otherwise. The history of our western country more than justifies the assurance that such return invariably follows. We have accorded to the individual and to the company the same rule of measurement, and it seems that in all fairness such rule should be applied."<sup>1</sup>

It is practically the unanimous ruling of courts that in determining the present fair value real estate must be taken at its existing value, although such value may be less than or many times greater than the original cost. This is a consistent doctrine and is applied logically in ascertaining the value of the property at a given time in the service of the public.

"It is insisted that in reproduction estimates the enhanced value of property between the time of the original location of a railroad through a wilderness or marsh, it may be, is not to be taken into account 40 or 50 years afterward, when civilization, perhaps largely the result of the expenditures and operations of the road, has increased original values a hundredfold. Suppose a road is located when original cost is fabulously inflated, and the course of events brings things down to their intrinsic worth, upon whom does the loss fall? It is usually understood that the state does not make up such losses to its citizens. And, *vice versa*, when minerals are discovered or oil wells developed on lands, does not the owner of the land own its product? And how are tax values estimated? Do the officers take the value when land is first entered and

<sup>1</sup> Decision of the Washington Public Service Commission, Dec. 24, 1914, fixing rates of the Pacific Northwest Traction Co.

cleared or when it has been improved and becomes a town site? The law is perfectly settled, with the obvious view of the matter, that increments and losses alike attach to ownership as to duties and rights pertaining to property. *Willcox vs. Con. Gas Co.*, 212 U. S. 52, 29 Sup. Ct. 192, 53 L. Ed. 382; *Stanislaus vs. Irrigation Co.*, 192 U. S. 215, 24 Sup. Ct. 241, 48 L. Ed. 406; *San Diego Land Co. vs. National City*, 174 U. S. 757, 19 Sup. Ct. 804, 43 L. Ed. 1154. And this just rule has its balances and adjustments making it not oppressive to the public in any case. It is to be noticed, too, that the rates in fact usually diminish with the increase in property values, because the increase of business dominates values and justifies lower rates; but, be that as it may, the rule of giving to the owner the increments of value and subjecting him to the losses in values has the unequivocal sanction of the law."<sup>1</sup>

**Paving.**—In the last two or three years there have been many authoritative decisions as to the value to be allowed for street pavements in rate-making. While the drift of opinion seems to be toward allowing the utility the value of pavements necessarily laid by it in installing and constructing its structures beneath street surfaces, excluding the value of all such pavements as have been laid at the expense of the public since the construction of utility property in the streets, nevertheless, the question cannot yet be considered as fully and finally settled. The present difficulties are doubtless largely due to the failure to appreciate and keep clearly in mind the difference and distinction between cost and value. If the fundamental purpose of the inquiry is to ascertain the actual investment, then only the cost of such paving as has been laid by the corporation should be considered; if, however, the cost of reproduction new is being ascertained, then the estimated cost of replacing all paving necessary to be laid in recreating the existing substreet structures must be taken. Modifications of either of the above methods may be advisable or necessary in order to determine facts upon which to base conclusions as to value. For example, it may be desirable to ascertain exactly how much pavement has been put down at the expense of the corporation; in other instances, paving over services connected with gas or water mains is sometimes paid for by the consumer, and in such cases the corporation has no rightful claim whatsoever that the value of such pavement should be included in the value of its property. It may be assumed that in every case the pavement in the street does not belong to

<sup>1</sup> *Louisville & Nashville R. R. Co., vs. Railroad Commission of Alabama*, 196 Fed. 821.

the corporation, regardless of whether the pavement is laid before or after the construction of the subsurface structures, or has been paid for by the corporation or the municipality.

Although the flat-footed decision of the Supreme Court in the Consolidated Gas Company case still stands, wherein the cost of reproducing all paving, whether laid before or after the subsurface structures were installed, was allowed in the value made the basis of rates, nevertheless, a more recent opinion of the United States Supreme Court in the Des Moines gas case reverses the previous position of the same court as announced in the Consolidated Gas case. The Supreme Court was called upon to decide an appeal from the District Court for the Southern District of Iowa to reverse a decree dismissing a bill which sought to enjoin the enforcement of a municipal ordinance fixing gas rates in the City of Des Moines. Judge Day, who wrote the opinion, refers to the master's report as giving "evidence of very thorough consideration of the subject," and referring to the exclusion of an item of \$140,000 by the master, the estimated cost of replacing pavements laid after gas mains were installed, says:

"As to the item of \$140,000, which, it is contended, should be added to the valuation, because of the fact that the master valued the property on the basis of the cost of reproduction new, less depreciation, and it would be necessary in such reproduction to take up and replace pavements on streets which were unpaved when the gas mains were laid, in order to replace the mains, we are of the opinion that the Court below correctly disposed of this question. These pavements were already in place. It may be conceded that they would require removal at the time when it became necessary to reproduce the plant in this respect. The master reached the conclusion that the life of the mains would not be enhanced by the necessity of removing the pavements, and that the company had no right of property in the pavements thus dealt with, and that there was neither justice nor equity in requiring the people who had been at the expense of paving the streets to pay an additional sum for gas because the plant, when put in, would have to be at the expense of taking up and replacing the pavements in building the same. He held that such added value was wholly theoretical, when no benefit was derived therefrom. We find no error in this disposition of the question."<sup>1</sup>

In answer to the Court's objections, given above, there could appropriately be quoted the very complete and logical statement

<sup>1</sup> Des Moines Gas Co. vs. City of Des Moines *et al.*, 35 Supreme Court Rep. 811.

of the Federal Court, in the Louisville and Nashville Railroad case, as to why the unearned increment in real estate is the property of a utility. The opinion is given on pages 134 and 135.

The California Commission has uniformly adopted the policy of allowing the value of paving only in case the same has been paid for by the utility regardless of whether the case is a rate or purchase and sale case. The Indiana, Arizona, New Jersey, in some instances New York, and many other Public Service Commissions have followed the same precedent.

On the other hand, a number of state commissions have held that all paving over subsurface structures owned by public utility corporations should be included in the value of the property of the latter in cases of purchase, sale or taxes. In its valuation of the property of the Appleton Water-works Company, the Railroad Commission of Wisconsin included the value of pavement over mains, even though it had been laid without expense to the company, excluding, however, the cost of pavement over service pipes as they had been paid for by the consumers, although at the time of the valuation they were owned by the utility. The Supreme Court agreed with the Commission in refusing to allow the value of the paving over the services, and in allowing the value of the paving over mains, saying:

"Cost of reproduction must mean the cost which will be necessarily incurred by a reasonably prudent and careful man, using ordinary careful business methods, in producing a plant of equal efficiency. Anything which under such a conduct of the business would cost nothing to reproduce cannot logically be included. It is not denied that if the city or a new water company were to establish a new plant the consumers could be required, as a condition of receiving water service, to do the work in question, and even furnish the pipe; such a requirement is quite generally enforced at the present time in cities of this class. \* \* \* This is not the case where land or other property of value has been voluntarily donated to the old company. With regard to such property it has been held in cases involving the fixing of rates that it is rightfully to be considered in arriving at the cost of reproduction. This result is reached on the idea that a new company could not count on receiving such gifts. Whether the logic of these cases be correct or not, we do not decide, but in any event the principle does not apply to expenses which may legally be assessed, and in the exercise of good business judgment ought to be assessed, against the consumer. For purchase purposes at least the only expenses which could be considered in the estimate of the cost

of reproduction are those which are reasonably necessary in a prudently conducted reproduction."<sup>1</sup>

In the Oshkosh Water-works Company case, the Wisconsin Commission considered and followed the rule which they had laid down in the Appleton case, which had received the approval of the Supreme Court.

In its opinion the Commission says:

"It is conceded that in reproducing a plant of efficiency equal to that of the existing plant it would be necessary to cut through all paving under which existing mains lie and that the cost of removing and relaying the paving would be a part of the construction cost. This principle was recognized and applied by the Commission in the Appleton case (*in re* Appleton W. W. Co., 1910, 6 W. R. C. R. 97, 122) and subsequently affirmed by the Supreme Court of this state in the case cited above."<sup>2</sup>

In a New York tax case the Appellate Division held that the reproduction cost of pavement laid with or without expense to the utility should be included in the value of a special franchise under the net earnings rule:

"When the pipes were laid in certain streets they were unpaved, and afterward the city paved the streets. In determining the reproductive cost of laying the pipes in those streets the cost of relaying the pavement was not allowed as a part of the reproductive value. We think it should have been. The fact that the paving cost the company nothing is immaterial."<sup>3</sup>

In line with the preceding decisions, the Maryland State Commission has very ably summarized the existing situation as to the valuation of pavements.

"While it is true that were this company not already in the field, and were it necessary for it or some other company to reproduce the property as it stands, it would be necessary to remove and replace the paving of the streets where its mains and pipes have heretofore been laid. It is to be borne in mind that the real effort of the Commission in all investigations of this character is to ascertain the fair value of the property actually used in the public service, and that the cost of reproducing such property is only one of the many elements to be considered in determining what is that actual value. The reproduction value is not

<sup>1</sup> Appleton Water-works Co. vs. City of Appleton, 142 N. W. 481.

<sup>2</sup> *In re* purchase, Oshkosh Water-works plant, 12 W. R. C. R. 662.

<sup>3</sup> 157 Appellate Division 165, 142 N. Y. Supp. 180, May 22, 1913.



in itself the actual value; it simply reflects upon that value, just as it would reflect upon the market value, if market value were the inquiry.

"The question as to whether or not the value of paving laid over and after the installation of gas pipes, water mains, or other subsurface structures should be included is a mooted one. In rate cases some authorities have disallowed the value of such pavement in fixing adequate return upon investment value, but as far as we are aware, the courts have uniformly held where value has been determined in purchase and sale cases, from a consideration of reproduction cost, that the value of all paving that would be disturbed by replacing the existing property should be included, regardless of the fact whether such paving was laid after or before the subsurface structures were installed. In rate cases, therefore, it may be material to separate the value of paving into that which has been cut through by the installation of pipes, mains, or other structures, and that which has been laid after the installation of such structures, but in purchase and sale cases, it would seem that the total value of the paving must be considered, because the question to be determined is not investment value but present value. It must be conceded that the purchase price of property may be, and often is, less than the owner's investment. It may be, where the facts warrant, that the purchase price is much larger than the owner's investment. In determining the rate to be allowed the owner, it may, under certain circumstances, be fair to fix the rate from a consideration of the owner's investment, but usually the question to be determined is present value, not original value."<sup>1</sup>

**Water Rights.**—In order to determine the basis on which to predicate the value of rights to or ownership in water, consideration should be given the development of existing laws and priority of use of water. The State and National laws of the United States, which relate to the control and use of non-navigable water, are far from being generally satisfactory. The existing laws are the result of conditions which have since greatly changed. The fundamental principle heretofore generally recognized in connection with non-navigable water is that the water may not be permanently diverted from its natural channel. Following British practice, the American courts and legislatures in the Eastern part of the United States have been accustomed to hold that the natural flow of a stream may not be interrupted or diverted to the detriment of any riparian owner farther down the stream, the right to use the water belonging to the individual who controls the banks of the stream. With the development

<sup>1</sup> 24 A. T. & T. Co. Com. L. 564, Aug. 27, 1913, Maryland Public Service Commission.

of the country and a growing public necessity for the diversion of water from its natural channel for various purposes, especially for municipal and irrigation use, the old riparian law is being modified by the right of appropriation and diversion. The latter principle has been very generally accepted in the West, where it is frequently necessary to divert water from its natural channels and convey it to distant points in order that it may be used most beneficially.

As conditions change, law and government may be modified to insure the greatest good to the greatest number. Consequently, the undue precedence given the use of water for navigation by the national authorities is being modified because largely obsolete, the most important use of water being in connection with the life and health of humanity. The order of the precedence to be recognized in granting the use of water is well set forth in a report of a special committee of the American Society of Civil Engineers "on a national water law":

"(a) The first use of water in importance and the one truly paramount, namely, that for the domestic or household requirements of man—one without which life itself must disappear—was not recognized as of sufficient consequence for consideration when the rights of navigation received their present prominence in this country. At the time of the adoption of the Federal Constitution, outside of New York City and Bethlehem, Pa., municipal or public water supplies appear to have been non-existent in America.

(b) The second use of water, in present importance, is that for the watering of live stock and the production of crops, upon which two factors depend the food supplies of the nation. The former of these applications is long recognized and well established, but the latter, now reaching its highest development in the vast irrigation systems of the arid and semi-arid States, is a use almost unknown in this country prior to the Civil War. Coördinate with this use, and as a necessary adjunct in many cases, is the drainage of lands rendered unproductive by an excess of water.

(c) The third in relative importance is the use of water in the disposal of city sewage, for, whether with or without preliminary treatment, the sewage from inland cities must of necessity be carried away and finally disposed of in natural waterways, which are a part of the great circulatory system of the country; and the right to the use of water for this purpose must be clearly recognized.

(d) The fourth use is that for manufacturing, and for the generation of power to be used in the production of the requisites of civilization.

The former is practically inseparable from the domestic uses in an ordinary municipality, but the latter is a larger, more specific and more easily distinguished use and is commonly designated power development. Closely related to the above is the preservation of property by protection against floods and the regulation of the stream flow to this end, as well as with a view to an increased utilization of the water.

(e) The fifth use is that for the transportation of the products of agriculture and the materials of manufacture, and for the convenience of travel, designated as navigation."<sup>1</sup>

Although many individual states claim the right to control all waters within their respective boundaries, the Federal Government has assumed the right to limit and control the use of waters on so-called public lands or in navigable streams, and in certain instances has prohibited the use of water, regardless of riparian ownership, even absolutely preventing the extension and completion of projected hydraulic developments, for example, at Niagara Falls, New York.

Under the law of appropriation, regardless of previous land grants or concessions or proprietorship in underlying or adjoining real estate, an individual or corporation may appropriate and use for any beneficent purpose the unappropriated waters of any stream. This doctrine limits the right to appropriate unappropriated water merely by the requirement that the water shall be actively and beneficially used.

The Western States particularly argue that as they were admitted into the Union upon an equal footing with the other states, they were given absolute control of waters within their boundaries and that, therefore, the Federal Government has no right to the control of the waters. A study of the decisions of the courts seems to indicate that there is no clear and conclusive finding to sustain their views.

The contention of the advocates of the doctrine that the States own and control both the navigable and non-navigable waters within their boundaries is usually based upon a line of decisions of the Supreme Court, particularly *Pollard vs. Hagan*,<sup>2</sup> where the point at issue was "whether Alabama is entitled to the shores of navigable waters, the soils under them, within her limits," the land in question being "covered by the water of the Mobile River at common high tide." The Court held that "the shores of

<sup>1</sup> Presented to the Annual Meeting, Jan. 19, 1916.

<sup>2</sup> *John Pollard et al. vs. John Hagen et al.*, 3 How. 212.

navigable waters and the soils under them" are reserved to the States, whether one of the original thirteen States or one of those later admitted to the Union. The decision has, in fact, nothing whatsoever to do with water rights, but deals with title to land.

Another case cited by the adherents of State rights is *Kansas vs. Colorado*, which involved a controversy between two States as to the diversion and use of water from the Arkansas River. The Court in that case stated:

"That if in the present case the National Government was asserting, as against either Kansas or Colorado, that the appropriation for the purposes of irrigation of the waters of the Arkansas was affecting the navigability of the stream, it would become our duty to determine the truth of the charge. But the Government makes no such contention."<sup>1</sup>

From the above it will be seen that one Federal question was eliminated from the case and with regard to another, namely, the authority of Congress to provide for the irrigation of arid lands, the Court said, discussing Section 3 of Article IV of the Constitution:

"But clearly it does not grant to Congress any legislative control over the States and must, so far as they are concerned, be limited to authority over the property belonging to the United States within their limits."<sup>1</sup>

The Court does not seem to hold, in the above case, that water was not the property of the United States. That contention was not made, and the decision of the Court upon the issue raised between the two States mentioned was:

"It is enough for the purposes of this case that each State has full jurisdiction over the lands within its borders, including the beds of streams and other waters."<sup>1</sup>

In *Jennison vs. Kirk*<sup>2</sup> the Supreme Court rendered a decision construing a Federal statute, Revised Statutes 2339, which expressly recognized or validated rights to the use of waters for mining, agricultural and certain other purposes in those cases where the vested rights were recognized and acknowledged by local customs, laws and decisions of the courts.

Another decision, *Broder vs. Water Company*,<sup>3</sup> is to the same effect as the preceding, and neither in the statute mentioned nor in the decision is there any grant or admission by the Court

<sup>1</sup> *Kansas vs. Colorado*, 206 U. S. 46.

<sup>2</sup> 98 U. S., 453.

<sup>3</sup> 101 U. S. 274.

that the States own or control the waters within the public lands or reservations. The statute referred to seems to be in the nature of a validation of possessory rights initiated in trespass or at least without specific authority, for if it was a recognition of the fact that the States control the water, why was the enactment of a Federal statute necessary? Examination of the enabling acts or grants to the various States does not seem either in specific language or in any other way, unless by implication, to convey the waters to the States, and if title thereto be in the Federal Government, and not conveyed by such acts, the title to the waters and the control thereof are still the property of the United States the same as are the areas of public land within the same States.

In *Light vs. United States*, speaking of government-owned lands, the Supreme Court said:

"The Government has with respect to its own lands the rights of an ordinary proprietor to maintain its possession and prosecute trespassers. It may deal with such lands precisely as an ordinary individual may deal with his farming property. It may sell or withhold them from sale.' *Camfield vs. United States*, 167 U. S. 524. . . . the Constitution declares, §3, Article IV, that Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or the property belonging to the United States. The full scope of this paragraph has never been definitely settled. Primarily, at least, it is a grant of power to the United States of control over its property."<sup>1</sup>

In the case of *Winter vs. United States*, certain white citizens of the State of Montana had appropriated under State laws and were undertaking to use water of Milk River. The United States enjoined such use on the ground that under an agreement the water was reserved for the use and benefit of the Indians of the Fort Belknap Reservation, and that being so reserved the water could never become subject to appropriation under State laws. The Court in this case said:

"The power of the Government to reserve the waters and exempt them from appropriation under the State laws is not denied and cannot be."<sup>2</sup>

A similar ruling was made, in respect to water reserved for the Black Feet Indians, in *Conrad Investment Company vs. United*

<sup>1</sup> 220 U. S. 523.

<sup>2</sup> 207 U. S. 564.

States.<sup>1</sup> It should be pointed out that at the time of the agreement with the Indians, the country involved was a territory and had not yet been created into a State and admitted into the Union, but it may be questioned whether the change from territory to State would alter the Court's ruling.

The general policy of Congress and the United States, with respect to the national parks or other similar reservations, is well known and recognized. In several instances, at least, the States have conceded or disclaimed civil and criminal jurisdiction within reserved limits, and recognized the Government's control of certain lands, timber, objects of interest, etc. The right of a State, if it had one, to waters on Government land or within reservations would be artificial and ineffective, because the State has no right to enter upon such Government-owned land adjoining the stream, or to divert water from the riparian owner.

Without referring to other cases that might be cited, in *Gibson vs. Chouteau*, with regard to the public domain, the Supreme Court said:

"No State Legislature can interfere with this right or embarrass its exercise."<sup>2</sup>

In a more recent case, where a public utility corporation claimed the right to appropriate and use waters of a stream on Government-owned land for hydro-electric development without first obtaining permission from the United States Government, the Circuit Court of Appeals, Eighth Circuit, sustained the contention of the Government that such action was trespass and unauthorized, saying:

"The proposition that absolute and perpetual rights in the public lands may be acquired for private gain by a mere appropriation without purchase or compensation and in the exercise of a State sovereignty, which transcends the constitutional power of the Congress, is a somewhat startling one."<sup>3</sup>

This case is now pending before the United States Supreme Court on appeal. It is hoped that the Court's finding in this case may definitely and finally settle all controversies as to questions of the State's ownership and control of water within its boundary.

<sup>1</sup> 161 Federal 829.

<sup>2</sup> 80 U. S. 92.

<sup>3</sup> *United States vs. Utah Power & Light Co.*

The right of a State to control the waters within its boundaries does not extend to water on Government-owned land unless Congress has conferred such right upon the State. In fact, the right of the State to control waters within its boundaries rests upon the same principles and goes only as far as the right of any other private or public riparian proprietor. Although nearly all the Western States are unanimous in asserting the exclusive control by the State authorities of all waters within their boundaries, and although the State of California has perhaps gone as far, if not farther, than any of the other Western States in these claims, nevertheless, the Superior Court of that State has itself very definitely and convincingly held that the State's rights to the waters are no more nor no less than the State has through ownership of riparian lands.

"The theory that the water of a non-navigable stream in this State is in some sense 'public water' has been advanced before. It has been claimed that a diversion of water under the provisions of the Civil Code (Secs. 1410 to 1422) constitutes a grant of the water by the State to the appropriator. The idea may have arisen from the statement sometimes made in the decisions that the riparian owner has no right in the corpus of the water (*Eddy vs. Simpson*, 3 Cal. 252), and that running water cannot be made the subject of private ownership, that the right to use the water of a stream 'carries no specific property in the water itself' (*Kidd vs. Laird*, 15 Cal. 179). This is far from saying that the property in the water is vested in the public, either for general use or as property of the State. The doctrine that it is public water, or that it belongs to the State because it is not capable of private ownership, has no support in the statutes of the State or in any decision of this court.

"The true reason for the rule that there can be no property in the corpus of the water running in a stream is not that it is dedicated to the public, but because of the fact that so long as it continues to run there cannot be that possession of it which is essential to ownership. It is in this respect similar to the air, which cannot be said to be possessed or owned by any person unless it is confined within impervious walls. One may have the right to take water from the stream, even the exclusive right to do so, but in that case he does not have the right to a specific particle of water until he has taken it from the stream and reduced it to possession. It then ceases to be a part of the stream. Such right to the water of running streams as there is under the law is vested entirely in the several riparian owners along its course. It is subject to the common use of all riparian owners, but neither has a specific property in any part of the water while it remains running in the stream. The United States, with respect to the lands which it owns in the State, is a riparian pro-

prietor as to the streams running through such lands. It is only by virtue of that fact that it has any right or power of disposition over the waters thereof. And its right and power in that respect is no greater and no less than that of any other riparian proprietor. By the act of July 26, 1866 (14 U. S. Stats. 251), the United States consented that private persons might acquire rights to water flowing in streams through its lands by taking possession thereof, that is, by diverting the same in such manner as should be provided by the laws of the particular State. Where such diversion had not been made, a grant of its lands by the United States to a private person without reservation would carry with it the riparian rights pertaining to that land in streams flowing through it, in the same manner as in the case of a grant of land by a private owner. So, also, the State, with respect to the lands it owns, which are not devoted to a specific public use, is in the same category as any other land owner. It has riparian rights with respect to such land in the streams running over it, which its grant carries to the grantee. The provisions of the Civil Code above mentioned have the effect of a declaration by the State that any person who may divert water from a stream in pursuance of those provisions will thereby obtain a right in the stream paramount to the riparian rights which the State may have therein by virtue of the fact that the stream may run over lands then belonging to the State. To that extent it operates as a grant from the State, but this is only because the State had the riparian right, and not because the water was in any sense public water devoted to public use."<sup>1</sup>

In determining the value of water rights there must be had a clear conception of what the owner of such rights is entitled to. The Supreme Court of the State of California has rendered an interesting decision indicating the limits to which water rights may extend even in the Western States. The case hinged on the right of the defendant to divert so-called freshets or flood flows of the Fresno River. The plaintiff owned riparian land and contended that it was entitled to all the rights pertaining to riparian ownership, that the freshet or flood flows occurred in almost every season of normal rainfall and therefore could not be diverted by the defendant. The Court spoke as follows:

"It is suggested that a different rule should apply in a semi-arid climate like that of California, where the fall of rain and snow occurs during only a limited period of the year and, consequently, streams carry in some months a flow of water greatly exceeding that flowing during the dry season, with the result that such increased flow is not, at all points, con-

<sup>1</sup> *Palmer et al. vs. Railroad Commission of the State of California et al.*, S. F. No. 6555, page 201.



fined within the banks which mark the limits of the stream at low water. But no authority has been cited, and we see no sufficient ground in principle, for holding that the rights of riparian proprietors should be limited to the body of water which flows in the stream at the period of greatest scarcity. What the riparian proprietor is entitled to as against non-riparian takers is the ordinary and usual flow of the stream. There is no good reason for saying that the greatly increased flow following the annually recurring fall of rain and melting of snow in the region about the head of the stream is any less usual or ordinary than the much diminished flow which comes after the rains and the melted snows have run off. Perhaps other considerations should apply where a river, in times of heavy flow, runs over its banks in such manner that large volumes of water leave the stream and spread over adjoining lands to an indefinite extent, there to stagnate until they evaporate or are absorbed by the soil. But the evidence of respondent, and this was the evidence on which the court below acted, fails to show that the water which defendant seeks to divert was such 'vagrant water.' The evidence of respondent was to the effect that at all seasons the water of the Fresno River, even though overflowing the banks of the channel in which it flowed during the dry season, formed a single and continuously flowing stream."<sup>1</sup>

The State regulating commissions have often failed to recognize and allow any value for water rights, as such, in addition to the values of other intangible elements or the physical property itself. This attitude is shown in the decision of the Public Service Commission of New York, Second District, decided in the matter of rates of the Cataract Power & Conduit Company:

"Such results as these will never satisfy the elementary sense of right and justice in the mind of any man with regard to the use of Niagara generated electric energy. No generating company using the water of Niagara River owns those waters or has any right or title to them whatsoever. By the permission of the Federal Government and of the State of New York, the generating companies operating at the Falls are given the free use of those waters in the production of electric energy. To say that by having been given the free use of those waters for that purpose they are vested with an unassailable right to charge as much for the electric energy developed as they would for energy developed by steam plant is a proposition which requires to be maintained rather than to be refuted. It may very well be that these companies are entitled, in view of all of the circumstances of the case, to a liberal return upon the capital actually invested in developing the energy. It may very well be that the people exploiting the enterprise are entitled to large, and even

<sup>1</sup> *Miller & Lux vs. Madera Canal & Irrigation Co.*, XXXVII, California Decisions No. 1960, page 115.

very large, profits for the skill they have displayed and the risk to which they have subjected their capital. It may be that the public ought to pay them very liberally for the work which they have carried on in the public interest; but to say that the public is entitled to no advantage from the use of these waters, that the territory which can be served with electric energy developed at Niagara Falls has no advantage and is entitled to no benefit by reason of proximity to those Falls, is to say something which does not appeal to the best judgment of mankind for an instant."<sup>1</sup>

It may be noted that the Commission after writing the above as to "a liberal return upon the capital actually invested" held that the rates should be reduced so that the fair return was "approximately 6 per cent." upon the "capital invested in the public service." It is only fair to state in passing that the company did not claim "the public is entitled to no advantage from the use" of water-power-produced as against steam-produced, electric energy but rather it proposed to divide its profit equally between the public and itself.

There has existed a tendency to regard water right values as analogous to franchise values and without value.

"What has been heretofore said concerning the inclusion of other intangible value, such as 'going concern,' 'good will' and 'franchise value' would apply to the inclusion of what is termed 'unearned increment value,' accruing by reason of the right to the use of water for the purposes to which it has been dedicated. We find, from a careful examination of the authorities cited, and these examined in our own research, that the courts and public utilities commission refuse to allow a valuation of this character other than the actual cost thereof for the purpose of fixing rates."<sup>2</sup>

In the case where a corporation acquires no proprietary interest but merely has a franchise to appropriate water for diversion, transportation and sale, it may be conceded the right of diversion is merely equivalent to a franchise right but that is distinct and different from value in the ownership of water rights.

"There is a striking analogy between the appropriation of water for beneficial purposes and the location of a mining claim. Neither the appropriation nor the location gives to the party claiming thereunder

<sup>1</sup> Decision of Public Service Commission of New York, Second District, in *re* Fuhrman vs. Cataract Power & Conduit Company, decided Apr. 2, 1913.

<sup>2</sup> Decision of Public Utilities Commission of Idaho, Apr. 13, 1914, in *re* application of Pocatello Water Co.

the absolute ownership in fee. Under the appropriation laws lawful possession of the water is dependent upon its being used for some beneficial purpose. Under the mining location laws the possession of the mining claim is dependent upon the performance of a certain amount of development work upon the claim each year. As long as these conditions are performed, the appropriator of the water and the locator of the mining claim are fully protected by law in the possession of the respective properties. A water right is not an intangible thing, but is in the highest degree tangible. A water right without water would be worth simply nothing at all. There can be no such thing as a water right without water, and water is not only property of a substantial nature, but it is included in the class of the highest grade of property, viz., real property, and, in its possession, transfer, and enjoyment, is governed generally by the same laws as those applying to land.

"Nowhere in any of the California decisions can be found any statement to the effect that a water right, within the meaning of the law, is not a thing of value. In the cases referred to, the decision of the courts was that the water companies had no water rights but simply franchises to render a service. Water companies engaged solely in the business of distributing and selling water are referred to as agencies. The ownership of the water is regarded as being still in the people and the companies as being merely invested with the franchise right of taking the water from its natural channels and delivering it to the people at reasonable prices for the service rendered."

\* \* \* \* \*

"In the recent case of Tonopah Water Company vs. Public Service Commission of Nevada the attitude of Judge Morrow with respect to the value of water rights was made entirely clear. The case of San Joaquin and Kings River C. & I. Company vs. Stanislaus County, in 191 Fed., was decided about two years before the hearing was had in the Tonopah water case. And yet at no stage of the proceeding did Judge Morrow utter a word which gives the slightest support to the theory that the water rights of a public service corporation are not to be considered as of value. In his revised opinion that distinguished and learned judge accepts, as intrinsically sound, my own contention made when acting as counsel in the case, that the Tonopah Water Company had no 'water right' within the meaning of the law; that the only water it possessed was percolating water, and, as such, a part and parcel of the soil. The Court held substantially in accordance with this view, and further held that there was no evidence that the Court could consider, proving the value of the water considered as a water right. But running all through the Judge's remarks when engaged in colloquy with the attorneys, as well as through the final opinion, was a clear indication of the view that a water right was a thing of value, properly to be considered when its value

was clearly shown. The trouble in that case was that all the evidence offered by the water company went to the value of a water right, *per se*, while it was made very apparent that there was no such water right, but that the company was simply the owner of a piece of ground saturated with water."<sup>1</sup>

The term "water rights" is used indiscriminately, whether applied to the values possessed by corporations diverting water for irrigation or sanitary purposes, or those using water perhaps on their own real estate for power development. It will be recognized that the value for the former purpose in any particular instance might be and usually is quite different from the value for power purposes and *vice versa*. Consequently, the method of measuring or determining the value of water for power development may not be applicable in determining the value of water for diversion, sanitation or irrigation.

A general method frequently applied to determine the value of any class of water rights is the "next available source of supply." This consists in estimating the excess in cost of plant and property, of the next nearest supply that might be made available, above or beyond the existing property, which excess cost is used as the basis from which to derive the value of the water rights of the existing property.

"To illustrate: If it costs \$120 a year more to haul farm produce from farm A than from farm B, and if money is worth 6 per cent., then the capitalized value of this \$120 annual difference is \$2,000. Hence, if all other things are equal, farm B has a value of \$2,000 in excess of farm A. Similarly if a distant water supply A causes an annual cost that is \$6,000 greater than is incurred with supply B, then supply B has a value of \$100,000 in excess of supply A, if money is worth 6 per cent."<sup>2</sup>

Where the power is being developed the value of the water rights is frequently estimated by a similar method except that the "next available source of supply" is not another water power but some other type of motive power such as steam or oil. The Railroad Commission of Wisconsin early appreciated the importance of this method of evaluating water rights and in several decisions analyzed and discussed the method but only recently accepted such engineering calculations as the basis of an award.

<sup>1</sup> Public Service Commission of Nevada *vs.* Nevada & California Power Co., Jan. 29, 1914, pages 36-39.

<sup>2</sup> *Engineering & Contracting*, July 8, 1914.

The views of the Commission are given in the following extracts from its decisions:

"That, as a rule, water powers have some value that should be considered, but there are wide differences of opinion as to what these values amount to. In estimating the value of water rights, it seems to be common practice among engineers to compute what it would cost to operate a steam plant in the same locality, under the same load and conditions. Finding by this calculation the cost per horsepower per year for the steam plant, the actual cost per horsepower per year of the existing water power plant is subtracted therefrom, and the saving of the water power over the steam power, as shown in the remainder, is called the value of the water right. In this way steam and water power plants are ostensibly placed on the same basis.

"From a purely commercial point of view this method of estimating the value of water power may, in the main, be sound. But it is not so clear that this can be said for it when the question is regarded from the point of view of public policy. This method, as stated, places water and steam plants on the same basis. By doing this it necessarily diverts all the advantages that may accrue from such water powers from the public to the private owners. In other words, it appears to deprive a locality of the natural advantages it might otherwise derive from being located near such water powers. If water rights are private property under the law, then all the benefits which accrue from these rights would probably go to their private owners. If, on the other hand, water power rights are public rights rather than private rights, then it would also seem that the public ought to share in any benefits that may be derived from such rights. Just what the law is in this respect, is a matter upon which we will not attempt to pass at this time.

"As to whether the respondent's plant can generate and distribute its current at relatively lower costs than a modern steam plant just large enough to furnish all the current needed for the city of Hudson, is not entirely clear. The comparisons we have made and the data we have collected for the purpose of determining this question indicate a small difference in favor of the present plant. At any rate, the present plant appears to be in a position to generate current at a somewhat lower cost than a steam plant. When it comes to the distribution of the current and to the fixed charges, on the other hand, the situation would almost seem to be reversed, for the distribution expenses and the fixed charges of the present plant appear to be fully as high as would be the case for a steam plant. Some of the reasons for this are found in the location of the plant, and in the fact that the present plant had to provide and has to maintain two separate dams or generating stations located some distance apart, and also some distance away from the city. To obtain absolutely reliable data as to the difference in relative cost of furnishing

light and power, as between the present plant and a substitute steam power plant, is a very difficult matter, there being a scarcity of data bearing upon these points. While the facts we have succeeded in obtaining indicate that the present plant may enjoy some advantages in this respect, these advantages do not appear to be as great as expected, nor are they as clearly established as they should be in order to furnish a safe basis for the valuation of the water rights.

"In view of the facts thus presented with respect to the value of water power rights, and in view of the further fact that this omission would not seem to affect the conclusions in this case, no attempt is here made to value the water power rights which are involved in this case. The elements considered in the valuation of the physical property of the plant include, of course, all improvements in connection with the water power."<sup>1</sup>

In the Beloit case, the Wisconsin Commission says:

"Expert testimony has been introduced by both the city and the company in regard to the value of the water power owned by the respondent. The company claims that the value of the water power in question is at the lowest estimate \$150,000. The city's experts, on the other hand, while conceding that a certain value attaches to this water power, will not concede the lowest value claimed by the company, and would place the value as between \$27,167 (Fowle's report) and \$50,000 (Evans' report). The staff has submitted no estimate of the value of the water power.

"It seems clear from the expressions of opinions thus made and from the general practice of engineers and other men in valuing water powers that the saving effected by the use of the water power over steam power, especially, measures the value of the water power. Other methods of appraisal are used and have been mentioned by the witnesses in these proceedings, namely, rental value and market value. These latter methods, however, are quite often open to objections which destroy their reliability and it appears that it is almost always necessary to fall back upon the method of calculating the saving over steam power and then, by capitalizing this saving, arrive at the total value of the water power.

"Referring further to the method of measuring the value of a water right by the saving over steam power effected by the use of such power, it is necessary to inquire closely into the relations between the water power and steam power in the particular plant under consideration, for it is obvious that where steam power is necessary as an auxiliary to the water power, that the saving effected in such case cannot be measured by the actual saving with the steam plant operating as an auxiliary. Such a

<sup>1</sup> 5 W. R. C. R. *Rose et al. vs. Burkhardt Milling & Electric Power Co.*, decided Apr. 8, 1910, page 146.

method of calculating the saving and thus the value of the water right would result in a larger value per horsepower for the imperfect water power than would be the case for a perfect or complete water power, calling for no steam auxiliary."<sup>1</sup>

Nowhere in the decision is any figure given as establishing a value allowed for the water power, which apparently was not considered in establishing the fair present value.

As will be seen from the preceding, the Wisconsin Commission has indicated for several years a leaning toward the acceptance of the theory that the value of a water power could be determined from a consideration of the saving in the cost of an equivalent amount of energy produced in a steam plant or other comparable source of power. In the recent case of the Rhinelander Power Company, where authority was sought to amend rates, the Commission definitely fixed the value of the company's water power from considerations of the saving in expenses resulting from the water power as compared with "the next available source of supply" a steam plant. After admitting that a theoretical saving of \$30,000 could be made for the hydraulic plant, the Commission holds that to be strictly comparable with a steam plant, the hydraulic plant would require an auxiliary steam plant; the cost of operating which, together with fixed charges, would amount to \$22,000, leaving an actual saving of "only about \$8,000 per year." After discussing some of the qualifying conditions of the case and apparently capitalizing the net saving of \$8,000 upon a 10 per cent. basis, the Commission concludes

"with these facts in mind it appears that \$80,000 is about a maximum value that could be fairly allowed for the water power rights under present conditions. This amount added to the value of the physical property, working capital and going value, bring the total valuation to approximately \$200,000."<sup>2</sup>

The New Hampshire Public Service Commission refused to fully accept the theory that the value of water power could be fixed by capitalizing its saving in the production of energy as compared with the cost of fuel, saying:

"Water power has value, if it produces energy at a sufficient saving over coal to offset the disadvantages attendant upon its variable pro-

<sup>1</sup> 7 W. R. C. R. City of Beloit vs. Beloit Water, Gas & Electric Co., July 19, 1911, page 187.

<sup>2</sup> Decision of the R. R. Com. of Wisconsin, Jan. 30, 1915, in re application of the Rhinelander Power Co. for authority to establish an amended schedule of rates, 15 W. R. C. R. 809.

duction. But the entire saving over coal, calculated on the total annual production of power, and capitalized, certainly far exceeds the value of the power—what one would pay for it as a substitute for a steam plant. \* \* \*

“One feature of the ‘saving over coal’ method of determining the value of a water power should not escape attention. We live in a region remote from the coal fields, the cost of transportation is heavy, and the price of coal is higher than in almost any other part of the country. On the other hand, ours is a mountainous State, with many streams having a large fall and furnishing an abundance of water power, much of which is still undeveloped. If we adopt the policy of valuing water powers in rate and capitalization cases by capitalizing their saving over coal, the people of the State are left subject to all the disadvantages attendant on remoteness from the coal mines, while enjoying no advantage from living in a region abundantly supplied with water powers. A ‘fair value’ of a water power in New Hampshire cannot be a value which takes no account of our natural resources, and makes electricity produced by water as expensive to the public as if produced by coal. \* \* \*

“The evidence as to their value on a coal saving basis has been given due consideration, but cannot be accepted as a final test of value.”<sup>1</sup> \* \* \*

The Railroad Commission of the State of California has until recently, consistently refused to recognize that utilities have any property values in water rights.

In the recent case, No. 1370, of the Eureka Water Company, where this Commission was fixing the compensation to be paid by the city, the company computed the value of its water rights on two bases, the additional cost that would be incurred by bringing the next available source of water into Eureka and an arbitrary price per million gallons supplied, each basis resulting in a value of \$100,000. While omitting a discussion of the propriety of a value of water rights, the Commission rejects the theory of the next available supply as absolutely untenable as determining the value of the existing supply or for any purpose whatsoever, stating that such cost has no reference to the value of any right to take water from the existing source of supply. Similar conclusions, as to the absence of value in water rights, were held in the Northern California Power Company case decided July 13, 1913, and others. These rulings of the California Commission are of particular interest because the Supreme Court of the United

<sup>1</sup> Petition of Grafton Electric Light & Power Co., decided Feb. 3, 1914, by New Hampshire Public Service Commission.



States has recently decided in the case of a California corporation that even for rate-making purposes the value of water rights must be determined and included as a part of the property upon which returns are to be allowed. This decision being supreme and final will probably henceforth compel recognition of, and allowance for water rights as a part of the property which must be valued, where title to, or control of such belongs to the utility being regulated.

The decision referred to was handed down Apr. 27, 1914, and is so illuminating, and of such importance as to warrant rather full explanation and quotation.

The ruling was made in the suit of the San Joaquin & Kings River Canal & Irrigation Co., against the County of Stanislaus *et al.* to restrain the enforcement of orders of the Boards of Supervisors of Stanislaus, Fresno and Merced Counties, fixing rates allowing a 6 per cent. return on tangible property, but giving no consideration to the water rights claimed by the appellant.

The Supreme Court confined its opinion solely to the question of whether water rights should be given consideration in evaluating property for rate-making purposes. The defendants refused to make such allowance, and in this position they were sustained by the Circuit Court, 191 Fed. Rep. 875. The United States Supreme Court said:

"The bill (to restrain the enforcement of orders passed by the Boards of Supervisors of the three defendant Counties, Stanislaus, Fresno & Merced, establishing water rates to be charged by the plaintiff) concerns rates fixed in 1907 and the question before the court has been narrowed to a single issue. If the plaintiff is entitled to 6 per cent. upon its tangible property alone, it is agreed that the orders must stand. But if the plaintiff has water rights that are to be taken into account, the rates fixed will fall short of giving it what it is entitled to and must be set aside. \* \* \* The Circuit Court dismissed the bill, 191 Fed. Rep. 875 and on this appeal figures are immaterial, the only question being whether the principle adopted is right.

"It is not disputed that the plaintiff has a right as against riparian proprietors to withdraw the water that it distributes through its canals. Whether the right was paid for, as the plaintiff says, or not, it has been confirmed by prescription and is now beyond attack. It is not disputed either that if the plaintiff were the owner of riparian lands of which its water was distributed, it would have a property in the water that could not be taken without compensation. But it is said that as the plaintiff appropriates this water to distribution and sale, it thereby

dedicates it to public use under California law and so loses its private right in the same. It appears to us that when the cases cited for this proposition are pressed to the conclusion reached in the present case, they are misapplied. No doubt it is true that such an appropriation and use of the water entitles those within reach of it to demand the use of a reasonable share on payment. It well may be true that if the waters were taken for a superior use by eminent domain those whose lands were irrigated would be compensated for the loss. But even if the rate paid is not to be determined as upon a purchase of water from the plaintiff, still, at the lowest, the plaintiff has the sole right to furnish this water, the owner of the irrigation lands cannot get it except through the plaintiff's help, and it would be unjust not to take that fact into account in fixing the rates. We are not called upon to decide what the rate shall be, or even the principle by which it shall be measured. But it is proper to add a few words.

"The declaration in the Constitution of 1879 that water appropriated for sale is appropriated to a public use must be taken according to its subject matter. The use is not by the public at large, like that of the ocean for sailing, but by certain individuals for their private benefit respectively. *Thayer vs. Cal. Development Co.*, 164 Cal. 117, 128—*Fallbrook Irrigation District vs. Bradley*, 164 U. S. 112, 161. The declaration, therefore, does not necessarily mean more than that the few within reach of the supply may demand it for a reasonable price. The roadbed of a railroad is devoted to a public use in a stricter sense, yet the title of the railroad remains, and the use though it may be demanded, must be paid for. In this case it is said that a part of the water was appropriated before the Constitution went into effect, and that a suit now is pending to condemn more as against a riparian proprietor, for which, of course, the plaintiff must pay. It seems unreasonable to suppose that the Constitution means that if a party instead of using the water on his own land, as he may, sees fit to distribute it to others he loses the rights that he has bought or lawfully acquired. Recurring to the fact that in every instance only a few specified individuals get the right to a supply, and that it clearly appears from the latest statement of the Supreme Court of California, *Palmer vs. Railroad Commission*, Jan. 20, 1914, 47 Cal. Dec. 201, that the water when appropriated is private property, it is unreasonable to suppose that the constitutional declaration meant to compel a gift from the former owner to the users and that in dealing with water appropriated for sale it meant that there should be nothing to sell. See *San Diego Water Co. vs. San Diego*, 118 Cal. 556, 567—*Fresno Canal & Irrigation Co. vs. Park*, 129 Cal. 437, 443, et seq. *Stanislaus Water Co. vs. Bachman*, 152 Cal. 716, *Leavitt vs. Lassen Irrigation Co.*, 157 Cal. 82. Decree reversed."<sup>1</sup>

<sup>1</sup> 233 U. S. 459.

## CHAPTER VII

### FRANCHISES, WORKING CAPITAL AND BOND DISCOUNTS

**Franchises.**—Almost without exception the State public utility commissions have held, and the various courts have frequently ruled, that a public utility corporation has no right to capitalize its franchise, particularly for rate-making. This ruling has been the same whether the franchise is exclusive, perpetual, limited to a definite term of years, or of the “indeterminate” type. The usual argument for the justification of such ruling is, that the public, having granted the franchise, should not be compelled to pay a return thereon. The conclusion, however, is not entirely warranted. There can be no question but what the rights that may have been granted under a franchise were once owned by the public but they were parted with for a particular purpose and in consideration of the carrying out of certain obligations, which, as long as fulfilled binds the grantor. As a rule, the utilities have omitted to make any claim for value of franchise in the same way that going value has not been claimed in many instances. This omission of claim for value has been perhaps an error, as it may well be argued that a franchise which was given some years ago, as an absolute conveyance, as an inducement to the investment of capital, and the development of a public utility should have its value recognized and return thereon allowed the same as any other donation. Years ago, when the Federal Government was anxious to have transcontinental railroads built to the Pacific Coast, it gave outright thousands of acres of land adjacent to, and in addition to, the right-of-way, in order to induce the investment of the necessary capital to build the railroads. This land never cost anything more than most franchises have in the past. The Supreme Court has repeatedly and distinctly held that railroads have unquestionable title to the land received as a donation from the government, and that they are justified in demanding returns on its full present value. Not many months ago the Supreme Court

decided in favor of the Southern Pacific Railway against claimants to mineral lands, worth approximately \$700,000,000, which had originally been given to the railroad by the Government. Reference has already been made, on page 47, to the recent decision of the Supreme Court in confirming the corporation's title to land given by the Government under the Oregon and California Railroad Land Grant. It would seem no less fair or logical to recognize the value of franchises granted by the public without cost—admitting the difficulty of fixing the fair value—than to allow the value of donated real estate. This view has been sustained in certain instances, notably in the Consolidated Gas Company case where the Court, sustaining an allowance of \$7,781,000 as the value of a franchise, said:

“It cannot be disputed that franchises of this nature are property and cannot be taken and used by others without compensation.”<sup>1</sup>

In the Kennebec Water District case, the Court stated:

“The defendants' request 11 should be given in this case. It has been given in part already. It is that the value of a franchise depends upon its net earning power, present and prospective, developed and capable of development, at reasonable rates, that the value to be assessed is the value to the seller and not to the buyer, and that ‘just compensation’ means full compensation for everything or element of value taken. *Monongahela Nav. Co. vs. United States*, *supra*. The appraisal must be made, having in mind what we have already said, concerning the character and duration of the franchises and the reasonableness of rates. While with these limitations, the owner is entitled to receive the value of the franchises, having reference to their prospective use as now developed, and to the future development of their use, consideration must also be had of the fact that further investment may be necessary to develop the use, and of the further fact that at any stage of development the owner of the franchise will be entitled to charge only reasonable rates under the conditions then existing. But, subject to such limitations, we think it should be said that the owner is entitled to any appreciation due to natural causes, such as, for instance, the growth of the cities or towns in which the plant is situated. *Cotting vs. Kansas City Stock Yards Co.*, 82 Fed. Rep., 850.”<sup>2</sup>

In the *Monongahela Navigation Company* case above referred to, Congress had passed an Act providing for the condemnation

<sup>1</sup> *Wilcox vs. Consolidated Gas Co.*, 212 U. S. 44.

<sup>2</sup> *Kennebec Water District vs. Waterville*, 97 Me. 185.

of the property of the Navigation Company, and specifically provided that no compensation should be paid for the franchise right to take tolls. The Supreme Court held that this provision as to franchise right was in violation of the Fifth Amendment of the Constitution, saying:

"So, before this property can be taken away from its owners, the whole value must be paid; and that value depends largely upon the productiveness of the property, the franchise to take tolls.

"The franchise is a vested right. The State has power to grant it. It may retake it, as it may take other private property, for public uses, upon the payment of just compensation. A like, though a superior, power exists in the national government. It may take it for public purposes, and take it even against the will of the State; but it can no more take the franchise which the State has given than it can any private property belonging to an individual."<sup>1</sup>

In the Spring Valley Water Company case, the Court said:

"That a franchise is property has been declared by the Constitution and affirmed repeatedly by the Supreme Court of the State of California."<sup>2</sup>

The Railroad Commission of Wisconsin has recently said, in fixing the value of corporation property to be purchased by a municipality:

"Even if the city could lawfully condemn the franchise of the company, it would not be benefited thereby to any material extent. As the franchise is essential to the operation of the property, any damage for taking such franchise, separate and apart from the property, would, under any valid law, result in requiring the municipality to pay the difference in the value of the property, including the franchise before and after the taking of the franchise."<sup>3</sup>

"It is suggested in the opinion by Commissioner Shaughnessy that, as a rule, the courts have held that franchises have no value for rate-making purposes. But he says that the case of *Willcox vs. Consolidated Gas Company*, in the 212 U. S. 19, is an exception to the rule. So far from such being the case, as I have read the authorities, the *Willcox* case in the 212 U. S. *supra*, is not an exception to the rule, but states the rule. And, what is of the first importance in this case, it is a rule established by the highest tribunal in this country, viz., the Supreme Court of the United States.

<sup>1</sup> *Monongahela Navigation Co. vs. U. S.* 148, U. S. 329, 341.

<sup>2</sup> *Spring Valley Water Company vs. San Francisco*, 165 Fed. 667.

<sup>3</sup> *Neenah vs. Wisconsin Traction Light, Heat & Power Co.*, P. U. R. 1915. A, 372.

"In the case of Willcox vs. Consolidated Gas Company the Court distinctly recognized the fact that the franchise was property and that it had a value to be considered for purposes of rate-making. All that the Court said which points toward sustaining my associate's contention, is that there was no evidence in the case that justified the lower court, in allowing an increased valuation for the franchise over and above that which has been given to it at an earlier date.. The increased valuation, from more than seven millions of dollars to twelve millions of dollars, was based simply upon the reasoning of the court below that the value of the franchise should increase *pro rata* with the increase of the business. This, though, was rejected by the Supreme Court, and, as I think, properly.

"If we turn to page 44 of the volume mentioned, we find this language:

"It cannot be disputed that franchises of this nature are property, and cannot be taken or used by others, without compensation. (Citing Monongahela Company vs. United States, 148 U. S. 312; people vs. O'Brien, 111 N. Y. L. and cases cited). The important question is always one of value.

"From the foregoing, it will be seen that the Supreme Court of the United States had previously decided the same question the same way and that the highest court in the great State of New York, a court second in dignity only to that of the Supreme Court of the United States, had done the same."<sup>1</sup>

A series of important decisions in the matter of franchise value have recently been handed down by the New Jersey Courts. The Board of Utility Commissioners of New Jersey, in fixing the rates in the Passaic District, for the Public Service Gas Company, allowed 30 per cent. of the value assigned to the structural plant to cover the value of the intangible property. As the Commissioners expressly stated, the allowance included everything outside the tangible property, also: "the entire value of all franchises primarily or secondarily, possessed or exercised by the Company in the Passaic Division." The Corporation appealed from the decision of the Commissioners, holding that no proper recognition of and allowances for franchise had been made in the value fixed for the company's property. The case was passed on by the Supreme Court of New Jersey, which, after reviewing the law in the case, stated:

<sup>1</sup> Public Service Commission of Nevada vs. The Nevada-California Power Company, decided Jan. 29, 1914.

"Logically, no allowance should be made for the value of the special franchise in a case where it is not legally exclusive and where the State still retains the right to fix rates."<sup>1</sup>

The Corporation, not satisfied with this decision of the Supreme Court, appealed to the New Jersey Court of Errors and Appeals, which Court, after first rendering a decision in December, 1914, in which it said: "We find ourselves unable to concur in this result," reversed the Supreme Court; later, in June, 1915, after rehearing upon further appeal the same Court reversed its own previous decision and sustained the decision of the Supreme Court. The Court, speaking through Judge White, rendered an important opinion from which the following passage is well worth repeating here:

"Taking up the second proportion, that the company's charter right to charge reasonable rates is in itself a valuable property right entitled to consideration in rate-making, I suppose it must be conceded that the franchise to charge as a 'reasonable rate,' sufficient to yield a net profit of 8 per cent. on the value of the company's property, as allowed and established respectively by the findings of the Utilities Commission in this case, is a very valuable property right. Certainly I think it is. That this valuable privilege is the company's is beyond question. That it is property is undoubted. That the law protects it against confiscation and subjects it to taxation follows as a matter of course."

"But that this valuable property right to charge 'reasonable rates' should by virtue of its own existence have the effect of converting itself into a still more valuable property right to charge 'unreasonable rates' is, of course, preposterous. Presumably the incorporators went into this public-utility business because they expected that their charter privilege to charge 'reasonable rates' for the gas they were to manufacture, distribute and sell would be a valuable one, but that fact and the fact that it has become so cannot have the effect of altering the terms of the contract made with the State . . . ."

The Court then discusses the basis of reasonable rates and concludes with the statement that:

"The plain fact is that the commercial value of the company's property right in its franchise can have no effect in fixing the rate it can charge, because by the terms of its contract with the State the stream of its franchise value arises from the spring of its right to charge 'reasonable

<sup>1</sup> 84 N. J. L. 482.

rates,' and in the very nature of things no stream can rise higher than its source."<sup>1</sup>

Under the régime that has heretofore existed, the franchises granted public utility corporations will be found to have greater or less value because being perpetual, or having a definite term of life, unless there is a contract stipulation that the rights given thereunder should be without value as against the donor. Consequently, some value perhaps merely nominal, or an estimated amount commensurate with the value may be recognized in the appraisal of utility property.

Even when the fact is clearly recognized and admitted, that a franchise is a contract between the public and the utility, and has value, the determination of the value of the franchise is not easy. In case a definite value of franchise has been recognized by proper public authorities, as in the case of the Consolidated Gas Company, or in case definite payments have been made in order to secure a franchise, the value for rate-making is easily fixed. In cases where public authorities are now granting franchises on the basis of some uniform charge the value of an equivalent franchise, free of any charge burdens, could be valued upon the basis of capitalizing the net savings. It is self-evident that the franchise value for rate-making purposes cannot be properly and equitably obtained by capitalizing net earnings, although such method is applicable where rates are reasonable or the determination of value is necessary for purchase and sale. For the latter purpose the accounting process is to determine the present worth of future net earnings on the basis of carrying out of franchise obligations and maintenance of the utility property. The determination must, of course, take into account the annual operations of the utility throughout the successive remaining years of the life of the franchise. Where a utility is charged for its franchise by the public authorities, the entire cost of the franchise is borne by the consumers, whether it is amortized during the life of the franchise or treated as a permanent investment entitled to a fair return; hence a franchise charge is merely an indirect collection of taxes.

A very excellent summary of the effect of charges being made for the granting of franchises has been given by the Wisconsin Railroad Commission in one of its earliest cases.

<sup>1</sup> Public Service Gas Co. vs. Board of Public Utility Commissioners, 94 Atl. 634.



"Franchises are not always obtained without cost. Many of them include provisions which entail outlays that may be charged either to the capital account or the operating expenses. The former may consist of considerations in the form of stipulated payments to the municipality, license fees, a certain amount of free service upon which values can be placed, and other items of this character. The latter may include the upkeep of streets and other property, extra services of various kinds, and other items of a similar nature. The former, again, would seem to be as much a part of the investment in the plant and in its business as the cost of the physical plant, and there would appear to be the best of reasons why such costs should be included in the value of the plant for rate-making purposes. The latter would also appear to be legitimate charges to the operating expenses. In fact, we can see no valid reason to the contrary. Both would seem to be just charges against the consumers. Both tend to increase the expenses, and consequently the rates, and these increases would seem to be fair and equitable to all concerned."<sup>1</sup>

In the case of a perpetual franchise, or "indeterminate" permit, no annual expense or charge to provide a fund to amortize the value of the property is necessary for inclusion in the items going to make up the sum total of operating charges to be borne by the public. On the other hand, where a franchise is limited to a definite term of years, the value of the property, less scrap value, must be amortized during the life of the franchise, thereby increasing the annual charge on the customers; the greater, the shorter the life of the franchise. This principle has been authoritatively recognized in the decision of the Public Service Commission of New York, Second District, in the Cataract Power and Conduit Company case, where the Commission says:

"The subject of general amortization has been necessarily discussed somewhat fully under the head of depreciation, of which it is essentially a part. It appears from that discussion that the company has been handling its amortization upon the theory that the term of life to be reckoned with was the term of its franchise, which expires Jan. 14, 1912. It has collected a large sum of money from the public upon that theory, which sum, if properly invested, will amount at the end of the term to upward of \$1,000,000. It may also be assumed that the company has practically proceeded upon the theory of a sinking fund invested in outside securities. In fact, a very considerable amount is actually thus invested. \* \* \* Since practically the company should be allowed to earn returns upon the investment value of all its property in

<sup>1</sup> Hill vs. Antigo Water Co., 3 W. R. C. R. 623.

the public service irrespective of the source from which the money was derived, we are compelled to adhere to the theory of the sinking fund invested in outside securities.

"Deducting from the total investment value of the property in service the value of the land as non-depreciable, the working capital, the materials and supplies, and making proper allowance for scrap value of the depreciable property, the Commission finds that the total depreciable property amounts to \$1,760,663. The sinking fund already provided will take care of \$1,065,968 of this. Hence there is depreciable property to the amount of \$694,695 which should be amortized during the 20 years of the franchise term remaining unexpired Jan. 14, 1912."

"It may be observed, however, that the amount which is to be amortized of the present capital of the company, both tangible and intangible, after making all suitable deductions for scrap values and property which is not subject to amortization, amounts to \$1,760,663, leaving a net amount to be provided for of \$694,695, which would require an annual payment into the sinking fund of \$23,342."<sup>1</sup>

Capitalization of franchise, aside from actual expenditures required by the public regulating body granting such franchise, has no proper warrant in an ideal system of public utility control and regulation. Exercising the right to regulate rates, the rate-fixing body must take into consideration and include as a part of operating expenses, to be paid by the public for the service rendered, any addition to the operating cost incurred by taxes that may be imposed by the public, either in the way of a fair return to be allowed on the capital invested in the original purchase price of a franchise, or as a toll, or levy on earnings or property. There is nothing in such tax that tends to improve service, or reduce rates; in fact, the exact contrary is more likely to result because operating expenses must embrace all fair and reasonable costs including taxes which thus become a further burden on the users of the utility service. Taxing a public utility is merely an indirect method of having its customers contribute to the public purse without thoroughly understanding and appreciating the fact that they are not getting minimum rates for service rendered. There is no sound logical or economic reason for compelling a public utility to include tolls or taxes, in its annual operating expenses.

The relations between the owners of a public utility property, operating a limited franchise, and the public are similar to that

<sup>1</sup> Public Service Commission, State of New York, Second District, *Louis P. Fuhrmann vs. The Cataract Power & Conduit Company*, Decided Apr. 2, 1913, pages 71-9.

of a capitalist who advances money under a mortgage on improved real estate. Not only must the owner charge rents sufficient to pay the interest on the money loaned, he must charge sufficient to provide funds necessary to operate the building, furnishing elevator service, cleaning, decorating, and regular repairs, but he must also charge an amount to provide a sinking fund that will pay off the mortgage when due. It is a mistaken idea in the case of public service utilities, too commonly known, that, when the public has paid operating expenses and a return upon the theoretically depreciated value of the property, it has fulfilled its full obligation to the investor, whereas the latter is entitled as a rule to receive from the public not only a return on the undepreciated value of his property throughout the entire period of its service, but, in addition, the full value of that property which is worn-out and becomes worthless in the service of the public, in order that both the return upon the investment and the investment itself may be received by the owner.

**Working Capital.**—The term “working capital” is usually taken to include that part of the capital investment of a Public Utility Corporation represented by:

*First.*—Necessary cash on hand and in banks.

*Second.*—The value of materials, stores and supplies in stock necessary for the normal conduct of the business.

The above limited use of the term working capital does not properly cover and include all of those quick assets which should be recognized and allowed in determining the fair value of working capital required by the ordinary, going utility.

In addition to the elements enumerated above, there should be considered and included accounts receivable and the accounts payable, as well as the value of other assets, such as prepayments, stocks on hand, or possibly even credits, by which the conduct of the business may be facilitated and its cost minimized.

In cases of purchase and sale, the cash on hand or in banks is not ordinarily transferred with title to the property. On the other hand, the present value of stores and supplies, the difference between accounts receivable and accounts payable, accrued interest, wages, taxes and prepayments, are all usually considered and equitably adjusted in the price paid by the purchaser.

It is generally conceded by authorities in public service regulation that the question with regard to working capital is not

whether any working capital should be provided as a part of the capital cost, but rather the amount of working capital to be properly allowed in the sum representing the total fair value of the property used and useful.

The amount of working capital will vary with the character of the business of the corporation being considered. With street railways, for example, where the fare is paid by the passenger in advance of the service to be rendered, the amount of cash working capital required by such utility will be very much less than in the case of a water-works corporation, which sends out bills only once in three or six months and receives its payment from four to eight months after rendition of service.

The cash on hand at any particular period, or the average of different periods, may not fairly indicate the cash quickly available for a utility, because other quick assets or individual credit may permit the drawing down of cash actually on hand to a minimum. In a similar way, the value of stores and supplies found to be on hand at any particular time may not be a fair indication of the amount to be allowed for this purpose. In the case of any particular utility being considered, regard must be given as to the distance from which stores and supplies are principally shipped, the time required for filling orders by the manufacturers after placing, the tardiness of transportation, due to distance or congestion; these matters all bear on the question of proper allowance of the quantities and hence the amount of capital equitably necessary for stores and supplies.

In determining the value of a utility, whether for rate-making or sale, consideration of all of the elements fairly constituting working capital should be ascertained and included or excluded, as the circumstances may warrant. These elements may fairly be divided as follows:

*Current Assets:*

- Cash.
- Stores and supplies.
- Manufactured product on hand.
- Manufactured product delivered to customers but not billed.
- Accounts receivable.
- Prepayments of insurance, taxes or other normal operating expenses.

*Current Liabilities:*

- Accounts payable.
- Interest accrued.
- Wages accrued.
- Taxes or insurance accrued.

Criticism of the acceptance, as working capital, of the excess of current assets over current liabilities has been made on the ground that such assets include at certain times cash held for investment, interest, dividends or taxes, which would thereby artificially increase the real working capital. Of course, this criticism is just in proportion to the amounts of cash regularly held in the bank for investment in plant additions but such criticism further assumes that interest, dividends and taxes are always wholly accumulated in cash before being paid out, which is not necessarily a fact. Working capital must be sufficient to provide funds for the purchase of repair parts and maintenance, as well as all other operating expenses, also such proportion of the interest, dividends, taxes and like expenses, which must be paid regularly, even though they may not yet have been paid in, though accrued, and in other instances where there is a temporary loss of revenue due to financial embarrassment or panic, strikes of labor or other abnormal conditions. Very frequently public utility corporations are not able to wholly accumulate interest payments in advance. In all considerations of the amount of working capital to be allowed any utility, liberality should be used, because the public is only called upon to pay a return on the amount allowed, and a very small difference in this respect would make a large difference in the credit, standing and financial ability of the utility, and in most instances would many times compensate the public for the small difference in return it would be called upon to pay between a niggardly or a liberal allowance for working capital. It is generally recognized that the working capital of a corporation doing a small business must be relatively large compared with the amount of working capital required by a corporation doing a large business, because in the case of the latter inequalities in receipts and expenditures tend to equalize and smooth themselves out, due to the very much greater number of transactions.

In order that a utility may be enabled to carry on its business with the maximum economy, resulting from advantageous buying and discounting of bills, there must be available, both the highest credit and sufficient cash on hand to take advantage of discounts. It may be argued that it is not necessary to pay for supplies as soon as delivered, because 30 or 60 days credit is obtainable. Again, it is claimed a utility with reasonable credit may borrow from time to time to provide for current

needs. The answer to the first argument is that a discount is usually obtainable for prompt payment as the seller must, of necessity, include the interest charge in his selling price if compelled to carry an account for 30 or 60 or 90 days. In reply to the second argument, borrowing of course requires the paying of interest on loans, which results in a higher operating cost to the utility and increases the rates for service rendered; consequently a fairly definite amount of cash on hand should always be held as liquid capital by every properly managed efficient public utility.

To render efficient service a utility must always have on hand and available an ample quantity of stores and supplies with which to make repairs or replacements that are ordinarily demanded at a fairly uniform rate, but which must be available in sufficient quantity at all times to provide for unexpected or sudden, unusual and exceptional demands. In order to manufacture or provide the commodity which is later sold to its customers, the utility must purchase and furnish in advance of consumption, sometimes for long periods previous to consumption, such items as fuel, oil, labor, etc. Consequently, in addition to cash on hand or in bank, there must be always conveniently available or in storerooms a quantity of stores, supplies, repair and renewal parts, as well as fuel, oil or other raw material required by the manufacturing processes that represent a proportion of the capital investment of a properly managed public utility.

In addition to stores and supplies on hand, the value of product manufactured or delivered, but not yet billed, such as gas in a holder or electrical energy delivered to consumers in advance of the monthly billing, may fairly be included. The value of these products, which often represent a substantial part of the capital of a utility tied up and invested in the business, has frequently been overlooked or ignored in fixing the proper basis for rate-making. It will be recognized that the books do not show the value of such product as has been manufactured, or possibly sold and delivered, until the bills against the consumers are made out, although the cost of manufacture has accrued against the company. Where bills are made out at frequent intervals the value of the product may not run into very large amounts, but where bills are rendered semi-annually, for example in the case of water-works, the value of the manufactured or

delivered product may prove to be a very considerable portion of the total value of the property.

Under the generally accepted terms and methods of doing business, goods and materials received are not paid for upon delivery, with the result that bills and accounts receivable and bills and accounts payable largely tend to offset one another, but their difference either as a credit or debit may be taken into account in ascertaining the proper and necessary working capital of utility.

It is frequently the case that the control of a public utility is held by a holding or controlling company through stock ownership. In such cases it is not uncommon practice for the holding company to have turned over to it at frequent intervals, perhaps monthly, practically all revenues received by the subsidiary corporation, then all bills for supplies, equipment, salaries, interest and other large items are paid by the holding company, the subsidiary corporations merely keeping small amounts of cash on hand with which to pay local, current bills. Under these conditions the holding company, and not the local corporations, as a matter of fact, requires the bulk of the working capital necessary to conduct the operations of the subsidiary corporations; hence the quick assets and cash on hand of the latter do not indicate the amounts required for the proper conduct of their business, because in such cases the cash, quick assets and credit of the holding company are used for the benefit of the subsidiary companies. In determining the proper amount of working capital that should be allowed a subsidiary company, controlled in the manner indicated, this credit of the subsidiary company with the holding company is usually equivalent in value to quick assets or cash actually on hand. This arrangement and credit of the subsidiary company with the holding company, together with the cash or other quick assets held locally by the former, the value of the stores and supplies on hand, both locally and at the distributing center, controlled by the holding company and held available for the benefit of the subsidiary company, together constitute the working capital of the subsidiary company. A fair method of ascertaining the total value of the stores and supplies, cash on hand and quick assets that may normally be allowed the subsidiary company, existing under such arrangements and controlled as outlined above, may be measured by the methods suggested as proper

for determining the working capital of a utility entirely locally controlled.

Various methods have been suggested for determining the proper amount of working capital required for the different classes of utilities under normal or average conditions. A very generally accepted basis of estimate is to fix the amount of cash working capital from a consideration of the annual gross revenues. This basis has been frequently accepted by courts and commissions as reasonable, because related to the amount of business being transacted and dependent, in a large measure, upon those receipts and their usually attendant expenses. Varying percentages of the annual gross revenue have been used for determining cash working capital, varying from 5 per cent. to 25 per cent. depending upon the character of the business and the size and credit of the corporation. An examination of the cash balances kept on hand by a number of public utilities of different classes, such as gas, electric light and street railway property, averaged over a large number of months, aggregating several years, shows that practically  $12\frac{1}{2}$  per cent. of gross revenue was maintained as the actual cash working capital on hand. This figure would, therefore, seem to have considerable weight as showing the normal average condition and the average requirements of such utility.

A second method of determining the normal amount of cash working capital required by a public utility, which is receiving much consideration, is based on an examination of the monthly and annual operating expenses and payments, as well as the conditions under which receipts from the sale of the service rendered by the utility, are received from its customers, by the corporation. It will be seen where receipts do not come in for 15 days, for example, after the expiration of the period to which such receipts relate, and the bills upon which such receipts are based are rendered the first of the month for service performed during the preceding month, the current liabilities of the corporation being largely incurred before the service is rendered, the payment of which liabilities under the wisest business management should not and cannot be deferred, there probably should be provided and available sufficient cash working capital to meet two months' average payments. When bills are not rendered monthly but over longer periods, still larger amounts of cash working capital must be provided than would be indicated by a two months' average payment of expenses. Moreover, an amount larger than that



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TABLE V.—WORKING CAPITAL  
Public Service Commission Decision, Working Capital Allowances

	Revenue	Op. expa.	Net	Repro. val.	Working cap.	Per cent. of	
						Rev.	Rep. val.
<b>Wisconsin:</b>	\$	\$	\$	\$	\$		
Madison G & E Co. { G { E	141,272 199,892	82,615 100,293	58,657 99,599	412,000 535,000	{ (45-50,000) (suppl. \$30,000)	15	5.8
Beloit W. G. & Elec. Co.	181,661	97,435	83,126	.....	45-45,000 (½ cash-¾ suppl.)	23.5	.....
<b>St. Louis Com.:</b>							
Union E. L. & Pr. Co. { G { E	.....	.....	.....	16,976,025	914,948 (484,578 cash)	.....	5.38
<b>Maryland Com.:</b>							
Consolidated G. E. L. & P. Co. { G { E	.....	.....	.....	26,417,414	{ 854,252 766,068 }	.....	6.1
<b>New York:</b>							
Bklyn. Boro. G. Co.	224,931	148,365 (including \$26,364 amortisa.)	77,170	1,136,476	40,000 (half cash and half suppl.)	17.9	3.5
Kings Co. Lt. Co.	642,040	349,792	289,645	2,477,579	80,000 (half cash and half suppl.)	12.5	3.24
Queensboro G. & Elec. Co. { G { E	.....	.....	.....	1,082,813 993,867	30,000 45,000	.....	2.77 4.55
Bronx Gas & Electric Co.	.....	.....	.....	1,130,000	45,032	.....	4.12
Rochester Corning Elmira Tr. Co.	.....	.....	.....	7,378,020	100,000	.....	1.36
Buffalo Gen. Elec. Co.	1,204,006	681,485	522,521	3,194,159	Cash 100,000 M. & S. 51,637	12.6	4.75
Cataract Pr. & Conduit Co.	1,516,100	1,153,000	.....	2,768,785	Cash 80,000 M. & S. 40,180	7.95	4.35
Federal Tel. & Telg. Co.	1,057,807	545,419	512,388	2,614,363	Cash 60,000 M. & S. 30,000	8.5	3.45
<b>Washington:</b>							
Pacific Pr. & Lt. Co.	653,651	286,718	366,932	4,700,000	255,000 (stores and cash)	40.0	5.44
COURT DECISIONS, WORKING CAPITAL ALLOWANCES							
Consolidated Gas Co.	\$ 13,552,482	\$ 9,936,910	\$ 3,615,572	\$ 55,612,435	\$ 1,616,000 (616,000 suppl.)	11.9	2.9
Passaic Gas Case	.....	.....	.....	4,750,000	250,000 (cash and suppl.)	.....	5.7
Third Ave. Railroad	3,164,582	1,704,477	1,460,105	12,179,217	662,118 (cash 400,285 suppl. 261,833)	20.9	5.44

required to meet normal average conditions must be allowed to provide for the contingent, unexpected and abnormal condition caused by strikes, financial stringencies, fire, accident or other unusual events, which prevent the normal receipt of revenue or call for more than normal expenditures.

A third basis of ascertaining normal working capital to be allowed any particular corporation is by fixing a ratio of that capital to the appraised value of the property. A consideration of the decisions of public service commissions and courts indicates that the sum of working capital allowed to cover stores and supplies and cash, together with quick assets, varies from 3 to 6 or 7 per cent. of the appraised value of the property; the stores and supplies frequently being about twice the amount of cash or cash assets. As explained above, the amount will, of course, vary with the character of the utility being considered and the practice that exists as to the frequency of rendering bills for service rendered and the promptness of payment of the users. From an examination of the decisions of commissions and courts, the foregoing table, showing typical allowances made for working capital, has been prepared:

**Bond Discount.**—There are conflicting opinions and rulings as to whether or not the amount of discount, that is, the difference between the selling price and the par value of bonds, should be included as a part of the property upon which rates are fixed.

It is generally conceded that the bonds issued by most public utilities must be sold for something less than par. The amount of discount necessary to effect the sale of any particular bonds, will depend primarily upon:

- (a) The rate of interest.
- (b) The ratio of the total bond issue to the total value of the property.
- (c) The class of property given as security for the bonds.
- (d) The ratio of interest charges to total net revenue.

Under varying conditions of the money market and changes in public opinion, whether warranted by existing circumstances or the result merely of misinformation or prejudice, the amount of discount at which bonds must be sold varies, regardless of the four primary conditions above mentioned.

Despite mathematical calculations and the contention of certain theorists with regard to the matter, bonds cannot be sold upon a uniform basis of return regardless of the rate of interest, that is, a 5 per cent. bond will bring a better price

relatively than a 6 per cent. bond issued by the same utility, on the same property, under the same conditions. For example, a 5 per cent., 20-year bond might sell at  $83\frac{1}{3}$  netting the investor 6 per cent. upon his money. If the same issue of bonds were made to bear 6 per cent. rate of interest, all other conditions remaining the same, they probably could not be sold at par in the market. Despite the seeming inconsistency, such conditions exist by reason of opinions or prejudices of investors, which must be recognized, admitted and consented to in dealing with bond discounts.

Whether or not bond discount is to be allowed as a part of the value of property, will depend upon the method followed in determining the value of such property. If, in addition to the value of the physical property, with its intangible elements, there has been included an amount to properly cover the cost of financing and other expenses incidental to raising capital, then there is no reason for including in the total value of the property any amount to cover bond discount. On the other hand, if bond discount is considered a part of the cost of financing, which necessary and essential element of value has not been taken into account and allowed for in the total value of the property, then the amount of bond discount should be included with the other costs of the property. This latter view is that uniformly taken by the Railroad Commission of Wisconsin, which, both in condemnation and rate cases, seems to look upon bond discount as the cost of financing.

"It is difficult to say on what grounds such discounts (on bonds) should not be included in the cost of the plant. To so include it, has been and is the almost universal practice."<sup>1</sup>

Other commissions and courts have recognized the justice and fairness of such allowance as has been shown at some length elsewhere.<sup>2</sup>

In many cases bond discount does not wholly represent the cost of financing; for example, the bonds may sell at 20 points below their par value, whereas the actual cost of financing may be only 5 points, leaving 15 points as profit to the purchaser of the bonds (assuming that he eventually realizes par) which profit is a part of the reward for consenting to accept the low rate of

<sup>1</sup> *Hill vs. Antigo Water Company*, 2. W. R. C. R. 627.

<sup>2</sup> "Valuation of Public Utility Properties," Henry Floy, page 118.

interest borne by the bonds. Such profits of the bond buyer must be eventually paid out of the fair return allowed on the property: it should not be charged to the public as an additional expense of rendering service, provided—and only in such case—said expense has already been made to include a fair return on the fair value of the property which value, as determined, covers all costs of financing.

Bond discount, in reality, is only a method of financing, in which the public may not be directly interested. If the promoters and owners of a utility enterprise are allowed such fair rate of return as to cover all reward due them for making an investment under the risks of such business, then that total return to them should provide all interest and profits, regardless of the principle or method of financing that may be followed. To illustrate: if a utility enterprise requires \$100,000 investment including all property costs, covering in addition to the outlay for physical property, the cost of developing the business, reward for promoters' services and expenses, cost of financing, and all like elements, and if 9 per cent. is considered a fair return above all operating expenses upon the investment, then \$9,000 per annum should be allowed the owners as their total return. If the owners, instead of providing all of the \$100,000 required, prefer to issue \$75,000 of 20-year bonds, selling them at 20 per cent. discount so as to furnish \$60,000 of cash, leaving only \$40,000 cash to be provided by them, they, in fairness, should provide out of the 9,000 actually allowed them as the total reward, such amount as is necessary to amortize the discount on the bonds. Otherwise, the public would be twice paying for the same thing. The owners, in issuing \$75,000 par value of bonds, would perhaps put them out, bearing 5 per cent. rate of interest, so that without taking into account the discount of bonds, they would only have to pay \$3,750 annual interest, whereas they would be allowed earnings of \$5,400 per annum on the \$60,000 invested. Now if the owners were not compelled to amortize the discount on the bonds, they would thereby make an annual profit of \$1,650 in addition to \$3,600, the 9 per cent. which we have assumed is the fair rate of return upon the money they actually invested, namely, \$40,000. Upon a 4 per cent. sinking fund basis covering a 20-year period, the assumed life of the bonds, there would be required \$504 per annum to take care of the bond discount. This added to the assumed interest on the bonds, \$3,750, makes a total of \$4,254, out

of the \$5,400 per annum allowed them, which it would properly cost the owners for the \$60,000 raised through the sale of bonds. The difference, \$1,146, equitably belongs to the owners for the additional risk they assume in practically guaranteeing a bond issue equal to 75 per cent. of the value of the property, and taking the additional risk of having their investment, amounting to 40 per cent. of the total, merely a second lien upon the property. In the same way, other illustrations could be given, which, by reducing the amount of the bond issue, would increase the amount of money to be provided by the owners, and at the same time very properly reduce their rate of return above the 9 per cent. allowed, as their risk is less, by reason of the fact that they now represent a larger proportion of the total investment in the property.

In the above discussion it is to be held clearly in mind that bond discount, where not taken into consideration in fixing the value of the property, must be offset and compensated for by including all financial costs fairly to be included as one of the elements of property valuation, such as commissions to a bond and brokerage house on the sale of securities, cost of advertising, printing, legal and trust company charges, and other necessary expenses of similar character. Moreover, when bond discount is excluded from property value, all of those proper expenses, such as bonuses, stock given away or sold at a discount or other concessions, fairly evaluated, that may have to be granted in connection with the raising of money for a utility enterprise, must be included as a part of the property value.

As intimated elsewhere, public authorities too frequently consider bond interest practically equivalent to fair return, and in such cases of erroneous procedure, bond discount may properly be included in property value as part of the "initial cost" of borrowed money, that is, the cost for its use over and above the actual cost represented by the nominal or coupon rate of interest. The rate of interest and the discount of the bonds are closely related, and together form the cost of borrowed money, so that the rate of interest on the bonds, without consideration of the discount, does not fix the cost of money.

Practically it is not always possible to segregate bond discount into its component parts, namely, the cost of the borrowed money itself if it could be obtained without expense and the brokerage or expense of obtaining the same. Recently there has been a

wider recognition of the various elements going to make up bond discount, and an earnest attempt to support these elements and properly allot them.

In some instances, bond discount partly represents interest during construction, and in that case is a proper charge against the property account. In the present-day desire to have the value of the property correspond with the value of the physical property, current practice tends to prescribe that bond discount be amortized from income, in order to extinguish such discount as a capital asset.

## CHAPTER VIII

### GOING VALUE

**Going Value must be Allowed.**—The term, going value, may properly be taken to mean a value attaching to a public utility property as the result of its having an established revenue-producing business. The total fair value of any utility property aside from franchise value, may be said, broadly, to consist of the sum of at least two quite distinct values, one, represented by the physical property including all of those preliminary and overhead costs necessary to prepare the plant to render service, the other, the non-physical but equally important costs to be met in creating the business and revenue.

Going value may be determined from a consideration of the amounts of money actually expended in the cost of producing the business, the same as the value of physical property may be arrived at from a consideration of the original cost thereof. On the other hand, going value may be determined from consideration of the present cost of reproducing the present revenue, just as the value of the physical property is determined from the cost of reproducing that property at present-day prices. In view of the fact that the cost of reproduction is coming to be accepted as the more generally applicable and accurately determined basis of value in existing properties, to be consistent, going value, determined upon the basis of reproduction rather than upon original cost, should logically become the most generally used basis for determining this element.

Going value is not in any sense "good will," which latter courts and commissions now unanimously agree has no place in the valuation of a utility property that is a monopoly. Neither does going value include franchise value, which, under the court and commission decisions thus far rendered, is frequently held to be no more valuable than the actual legitimate expenditure made in securing the franchise, in the way of costs of perfecting title or payments to public authorities.

Until comparatively recently, it has been strongly argued that the fair value of public utility property should not include anything for going value. But the overwhelming weight of recent court decisions holds clearly that going value is properly a part of property value and must be recognized and allowed.

The recent decision of the Supreme Court of New Jersey upheld the very large allowance made by the Public Utility Commissioners of New Jersey in ascertaining the value of the property of the Gas Company upon which gas rates were fixed in the so-called Passaic case. The Commission had allowed \$1,025,000, namely, 30 per cent. of the value of the structural property, for going value; the cities affected claimed that no allowance should be made for this item, but the Court said:

"It is necessary, therefore, to determine first whether any allowance at all for going value is proper. We think both on weight of authority and on reason there should be such an allowance.

"The legal question is whether these items constitute a going value upon which the company is entitled to a return if the individual rate is to be just and reasonable. To this we answer, yes. The argument addressed to us on the other side is that all the so-called going value appears in the valuation of the physical plant at the cost of reproduction; the suggestion is that unless there was going value the physical plant would be a mere junk, and that the difference between the valuation as junk is the true going value. The argument seems to us specious rather than sound. We think that if by value we mean what the economists call exchange value, then a buyer would undoubtedly give more for a plant already doing a profitable business than for a plant of equal cost, capacity, and future possibilities, but without the established business. To a purchaser the assurance of an immediate return is worth paying for, and we see no reason to doubt the correctness of the ruling of the United States Supreme Court in *Omaha vs. Omaha Water Co.*, 218 U. S. 180. \* \* \* It is true that that was a condemnation case and not a rate case, and involved, therefore, a question of exchange value, and not the question of a fair and reasonable valuation as between a public service company and the public. The two bases of valuation may properly be different, since upon a sale or condemnation the probability of an assured income and a continuance of the existing rates enters into and affects the exchange value; while in the case of a valuation for the purpose of fixing a rate, the question is what value and rate will tempt the investment of capital, and to what extent existing rates may with justice be lowered. In this view the fallacy of the argument on behalf of the cities is that it requires the investor to suffer all



the loss if the enterprise fails, and deprives him of the chance of additional gain if the enterprise succeeds; and it fails to allow any recompense for the skill shown in developing and conducting the business or even for the value of experience, which is proverbially expensive.”<sup>1</sup>

Among other explicit court opinions, as to the reasonableness of and necessity for recognition of going value, the following may be quoted:

“The receiver of a water company furnishing water to a city for fire purposes without contract as to price is entitled to recover, as a fair compensation for the service, a just proportion of the operating expenses, taxes, and cost of administration paid by the company, and of a just and reasonable return on the cost of reproducing its plant and its going value.”<sup>2</sup>

“In consideration of the fact that the system is a going concern, the appraisers should consider, among other things, the present efficiency of the system, the length of time necessary to construct the same *de novo*, the time and cost needed after construction to develop such new system to the level of the present one in respect to business and income, and the added net income and profits, if any, which by its acquirement as such going concern, would accrue to a purchaser during the time required for such new construction, and for such development of business and income.”<sup>3</sup>

“In ascertaining the present value of said plant, for the purpose of fixing rates that shall be charged for services thereon, the Corporation Commission should not confine its consideration to their valuation of the bare physical plant, where such exchange has a large patronage sufficient to pay operating expenses, fixed charges, and some profits, when such patronage has been built up by expenditures of labor and money for a period of time during which the plant was operated at a loss; but these facts should be considered, and a reasonable amount allowed for its earning capacity as a going concern.”<sup>4</sup>

“Thus the first question certified required us to decide whether ‘going value’ is to be appraised as a distinct item, or whether it is sufficient to regard it as something vague and indefinable to be given some consideration but not enough to be estimated. The valuation of the

<sup>1</sup> Public Service Gas Company vs. Board of Public Utility Commissioners, 87 Atlantic 657.

<sup>2</sup> Venner vs. Urbana Water Co., 174 Fed. 348, the 2nd.

<sup>3</sup> Kennebec Water District vs. Waterville, 97 Me. 185.

<sup>4</sup> Pioneer Telephone & Telegraph vs. Westenhaber, 29 Okla. 429, 34 L. R. A. N. S 1209.

physical property was determined by ascertaining the cost of reproduction less accrued depreciation. Preliminary and development expense prior to operation were included, but no allowance was made for the cost of developing the business. By that method, the plant was valued in a sense as a 'going concern,' in other words, 'scrap' values were not taken; but to say that that sufficiently allows for 'going value' is the same as to say that 'going value' is not to be taken into account. \* \* \* It (the company) would have been entitled to a return on the valuation adopted by the Commission, if it had no customers, but was just ready to begin business, whereas it had a plant in operation with an established business, which everyone knows takes time, labor and money to build up. \* \* \*

"It may be conceded that going value has no existence apart from tangible property and that commercially there is but one value, that of the property as a whole, but as the rate cannot be made to depend upon the exchange values, which would in turn depend upon the rate, it would seem to be necessary to appraise the physical property and the going value separately, and of course that is the case if the cost of reproduction rule be adopted."<sup>1</sup>

"The decision of the Supreme Court in the Cedar Rapids Gas Light Company case is so frequently and vehemently used to prove that this Court does not recognize or allow going value, it seems worth while to go into the details of this case and show therefrom that the Supreme Court actually does recognize going value as an element of value instead of excluding it.

"The opinion in the Cedar Rapids case decides:

1. That because constitutional questions not frivolous appear upon the record the motion to dismiss the appeal should be overruled.

2. That there was no contract on the part of the city that the price should be kept high enough to allow a discount for prompt payment.

3. That the facts were not open to reexamination except as such reexamination might be incidental to the questions raised by the assignments of error.

4. That it was not such a clear case as to warrant the reversal of a decree which, though final in form, merely postponed a decision upon the merits.

<sup>1</sup> The People ex rel. Kings County Lighting Co. vs. Wilcox *et al.* Composing Public Service Commission, First District, State of New York, Court of Appeals; decision rendered Apr. 24, 1914, 210 N. Y. 479.

"As supporting the conclusion that the case did not require its interference, the Court said:

'To refer in the first instance to the point just mentioned, we cannot say as matter of law that at 90 cts. a thousand cubic feet that company will be unable to collect payment without losses that will amount to a taking of its property. Then, again, although it is argued that the Court excluded going value; the Court expressly took into account the fact that the plant was in successful operation. What it excluded was the good will or advantage incidental to the possession of a monopoly, so far as that might be supposed to give the plaintiff the power to charge more than a reasonable price.'

"If we construe this correctly, it means that this case is not so clear as to justify interference because in the first place the Court could not say as a matter of law that 90 cts. was confiscatory; in the second place, while it is claimed that the Court excluded going value, the Court in fact took into account this factor; what it excluded was good will which was properly excluded upon the authority of the Consolidated case.

"To clearly apprehend what the Supreme Court decided, it is necessary to go to the opinion of the Supreme Court of Iowa. That Court said (144 Iowa 434) with reference to going value:

'Also the sum of \$100,000 was included by these witnesses as enhancement of value by reason of being a 'going concern.' As previously intimated, the value of the plant is to be estimated in its entirety, rather than by the addition of estimates on its component parts, though the latter course will materially aid in determining the value. Advantages have accrued through the sagacity of its management as contended by appellant. So, too, there are the inevitable mistakes which would not be likely in the construction of a new plant; but to put a new plant in profitable operation, time would be required, and, aside from the intangible element of good will, the fact that the plant is in successful operation constitutes an element of value.

'As said, the value of the system as completed, earning a present income, is the criterion. Insofar as influenced by income, however, the computation necessarily must be made on the basis of reasonable charges, for whatever is exacted for a public service in excess of this is to be regarded as unlawful.

'Save as above indicated, the element of value designated a 'going concern' is but another name for 'good will,' which is not to be taken

<sup>1</sup> Cedar Rapids Gas Light Co. vs. Cedar Rapids, 223 U. S. 669.

into account in a case like this, where the company is granted a monopoly. *Cedar Rapids Water Co. vs. City of Cedar Rapids*, 118 Iowa 234; *Wilcox vs. Consolidated Gas Co.*, 29 Sup. Ct. 192. The witnesses for plaintiff took into account 'good will' in giving their opinion of the enhancement in value because of being a going concern, and we have no means of separating these so as to ascertain their estimate of the separate advantage of completion so as to earn a present income.'

"If this means anything, it means that the Supreme Court of Iowa recognized the propriety of considering going value as an element of value. It says distinctly and affirmatively: 'The fact that the plant is in successful operation constitutes an element of value.' It says further: 'As said, the value of the system as completed, earning a present income, is the criterion.' It calls going value 'an element of value' in distinguishing it from good will, which is excluded.

"That the Iowa Court might properly have excluded this evidence is obvious. It held that the testimony failed to discriminate between good will, which could not be considered, and going value, which must be considered; and the fact that the Court had 'no means of separating these so as to ascertain their estimate of the separate advantage of completion so as to earn a present income' would justify excluding the evidence. Obviously, if the Court had intended to hold evidence as to going value as well as good will incompetent, there would have been no occasion for its distinguishing one from the other.

"It is upon this record that the United States Supreme Court uses the language which has been quoted above, saying not that the Supreme Court of Iowa excluded going value, but that 'although it is argued that the Court excluded it, the Court expressly took into account the fact that the plant was in successful operation.'

"If the Court excluded this evidence, the complainant could have assigned error; and upon this assignment it could have presented to the Supreme Court the question whether or not the ruling was correct. This is the only question that could have been made upon this record. The opinion of the United States Supreme Court does not show whether this was done, except inferentially in the statement that it is argued that the court excluded going value. The Supreme Court of the United States said:

'We perhaps should have adopted a rule as to depreciation somewhat more favorable to the plaintiff, or, it may be, might have allowed this or that item that the state Court struck out, but there is nothing of which we can take notice in the case that could warrant us in changing the result or in saying that the plaintiff did not get as much as it could expect when leave was reserved for it to try again.'

"The case was affirmed. Technically and exactly this affirmation is a decision that the ruling of the court below upon this question of testimony was correct, assuming that that question was properly made and argued, and assuming further that it is not one of the matters to which the court referred in the last extract which has been made from the opinion where it says that in various respects it might not have done what the State Court did. If this case indicates anything upon the question of going value, the sentence, "then again, although it is argued that the Court excluded going value, the Court expressly took into account the fact that the plant was in successful operation," taken in connection with its opinion in which the Supreme Court of Iowa says: "Aside from the intangible element of good will, the fact that the plant is in successful operation constitutes an element of value," and says further, "as said, the value of the system, as completed, earning a present income is the criterion," it is a recognition of the fact that going value cannot be eliminated.

"Any doubt as to the proper construction of the Cedar Rapids case is settled by an analysis of the figures. If we take the valuation of the physical properties which the State Court took in the discussion of the question and make the deductions which it clearly makes, the conclusion that the court included an allowance for going value and an allowance for paving over mains is inevitable. The following computation, with references to the pages of the opinion, is reported in 144 Iowa, where the various items may be found:

'Plaintiff's chief expert estimated the physical properties to be worth' (page 438, last line).....		\$365,564.41
'This included \$43,580 'increase of value of pipes and mains because of being underneath the pavement' (line 25, page 437).		
'Deduct the following items included in the foregoing total of \$365,564.41 and definitely disallowed by the State Court:		
(1) Working capital included at \$25,000 and allowed at \$2,500 (page 433, line 23).....	\$22,500.00	
(2) The so-called annex, real estate intended for future use, unnecessary for present use (page 435, line 22).....	16,500.00	
(3) Deductions made by the Court from the valuation placed by the complainant upon its real estate \$15,000 to \$20,000 (page 436, line 20) say.....	17,500.00	
(4) Purifiers (page 436, line 27).....	1,600.00	
(5) Deductions on account of excessive price of cast-iron mains (page 436, last paragraph) say.....	5,000.00	
(6) Marion high pressure line $\frac{3}{4}$ of \$5,483 (page 437, line 23).....	4,112.00	
(7) Promotion and organization (page 438, lines 21 and 31-2).....	14,943.69	82,155.69
		<u>\$283,408.72</u>

"This amount, \$283,408.72, is the maximum valuation of the physical property because only those deductions have been made that are specifically warranted by the opinion.

"In the foregoing no deductions are made for either of the following items included in the \$365,564.41 although the references to these items in the opinion unmistakably indicate that they were not allowed to their full amount.

'Brought forward .....		\$283,408.72
(8) Interest during construction (page 438, lines 20 and 24).....	\$22,415.00	
(9) Engineering (page 438, lines 21 and 28).....	18,679.61	
(10) Increased value of mains because of being underneath paving (page 437, line 25).....	43,580.00	84,674.61
		<u>\$198,734.11</u>

"The Court found (page 439, line 33), 'that a fair valuation of the entire plant is somewhere between \$300,000 and \$350,000.' A deduction from this value of some amount between \$283,408.72 and \$198,734.11 above, will leave what the Court allowed for going value. The following conclusions are inevitable:

"If interest during construction, engineering and increased value of mains because underneath paving were allowed in full, then the value of the physical property, aside from going value, is \$283,408.72, and there is allowed as going value some amount between \$16,591.28 and \$66,591.28.

"To contend that the entire item of paving over mains was disallowed in this case, involves increasing the allowance for going value by the amount of this item, \$43,580, which would make it somewhere between \$60,171.28 and \$110,171.28, an amount relatively so large as to render this hypothesis extremely improbable.

"If the items, interest during construction, engineering and increased value of mains because underneath paving, be substantially reduced, which in view of what is said about them in the opinion is clearly what was done, then the amount of such reduction must be added to what otherwise was allowed for going value.

"This mathematical demonstration removes all doubt as to the construction of the language in this opinion that has been already referred to. The Court said (page 434):

'The fact that the plant is in successful operation constitutes an element of value.'

"And again, when it stated its conclusion at page 439, the Court used the significant language:

'A careful review of the entire record, which has been repeated, has led to the conclusion that a fair valuation of the entire plant is somewhere between \$300,000 and \$350,000.'

"The language of these extracts taken in connection with the items which go to make up this valuation makes it impossible that the Court should have intended to exclude either going value or appreciation in the value of the mains on account of paving over them."<sup>1</sup>

**Going Value in Rate Cases.**—Going value is now usually recognized as a part of utility property whether the value is being considered in rate cases or for purposes of sale. Practically all of

<sup>1</sup> Brief of E. F. Jones and B. W. Couch, counsel for The Peoples Gas Light Co., Manchester, N. H. Pages 53-58.

the earlier cases carried to the higher courts for decision were "sale" cases. That is the utilities, mostly water-works companies, were being sold under contracts of purchase or condemnation by cities. Many early decisions by courts in the New England States recognized and allowed going values in the case of purchase of water-works or gas companies. Later the Supreme Court in passing upon the value of the property of the Omaha Water Company, which was being purchased by the City of Omaha, in allowing a very substantial sum, \$562,712, for going value said, in referring to the Knoxville Water and Consolidated Gas cases, "Both cases were rate cases and did not concern the ascertainment of value under contracts of sale." This has been taken by many authorities to indicate that the Supreme Court would not recognize and allow going value in rate cases as distinct from sale cases. This somewhat gratuitous assumption has never been approved as a principle by any decision of the Supreme Court, although in the Knoxville rate case a definite amount for going value was included without the question being determined whether properly so included. On the other hand, the lower courts and other authorities have repeatedly allowed going value as an element in rate-making and have definitely and expressly stated that it makes no difference whether value is being determined for the purpose of fixing rates or condemnation and sale, going value must be considered and allowed as a part of the fair value of the property. Some instances where the courts have definitely stated that going value is to be allowed in rate cases as well as in sale cases are as follows:

In the Spring Valley Water-works Company rate case, where an application was made for an injunction to enjoin the enforcement of a rate, the injunction was granted, the opinion stating:

"It is true this was a condemnation proceeding, and the question was to determine what was just compensation for the appropriation of corporate property to a public use, while the case before this Court relates to the fixing of water rates which shall be a just compensation for the appropriation of complainant's property to a public use. It is not perceived that there is any difference in the principles applicable to the two cases, and this appears to have been the view of the Supreme Court in *San Diego Water Co. vs. San Diego*, *supra*" (118 Cal. 556).

The complainant in this case contended, as stated by the Court, that it had an established business as a water company



and as a going concern, that its plant had a value, by reason of these advantages, beyond the mere cost of reproduction. The Court cites in this connection the leading case of *National Water-works Co. vs. Kansas City*, 62 Fed. 853, and, after quoting from the same, adds the following:

"This was also a condemnation proceeding, but, as before stated, the principles of compensation applicable to such a case appear to be applicable to the present case."<sup>1</sup>

In the *Des Moines Water Company* rate case where the company sought to enjoin the enforcement of an ordinance of the City of Des Moines, fixing rates, on the ground that such rates as fixed were confiscatory, the master in chancery, Mr. G. F. Henry, submitted an unusually carefully prepared report, which contains a most exhaustive review of the cases on going value. The master comments on an earlier decision of the Iowa Court in the *Cedar Rapids Water Company* case, where the question of whether or not going value should be recognized for rate-making purposes. The master in explanation of an allowance for going value, which "when reduced to dollars and cents is not more than \$168,277 and is not less than \$167,251," that is practically 10 per cent. of all the other elements of value entering into the property, says:

"So far as I have been able to learn this expression by the Supreme Court of Iowa of seeming doubt as to the right to include in this 'going value' in arriving at the value of a water-works plant in determining a fair rate of profit from the operation of such a plant, is the only expression of this character from any court of last resort. Several of the courts, as will have already been noticed, say that they know of no logical distinction between sale cases and rate cases with respect to the right to include this element of value. I see no logical distinction and am of the opinion, in the light of the foregoing authorities, that it must be included."

This decision of the master was confirmed in all respects by Judge McPherson in September, 1911, with the following statement on the question of going value:

"The master has found and fixed a valuation upon this property, as a going concern, as distinguished from the naked plant. As to this, both reason and authorities sustain him. Everything of a business character is thus valued. \* \* \* A telephone system may have its wires, but before the business can be profitable it must have patrons. It takes

<sup>1</sup> *Spring Valley Water-works Company vs. City, etc., of San Francisco*, 124 Fed. 594, 865.

effort and money to get patrons. While obtaining patrons the capital stock is earning but little or nothing. The street car system may have laid its rails and built its power plant, and have bought its cars; but it does not have the value that it afterward will have when its business has been adjusted and the people have adjusted their business and their conveniences to work in harmony with the system thus established. The newspaper plant may have its editors and reporters, and its presses, buildings, and offices. The physical valuation in the one case is just the same as in the other. But two newspapers, possessed of equal physical valuation, are not of the same value, as everybody knows. Two merchants may have the same stock of goods, as to value, and may be equally well located, and may own the same amount of real estate, in value. It is not material whether we call it 'good will' or the 'value of a going concern,' but there is an intangible value there, and the owner has the right to have it determined on such increased valuation.

"These rules apply with equal force to a water-works system. It took a long time to build up the system. First, it had to get in touch with the patrons, make contracts, install meters, and establish the business. During that period the capital stock was not earning what it should have earned. Now that it is a going concern, it is entitled to have these values considered, in arriving at the true valuation of the plant. Such reasoning is indorsed by courts, both national and State Supreme Courts, and such conclusions are the result of sound reasoning. Such are the tests in all other vocations and business enterprises."<sup>1</sup>

The Supreme Court of the State of New York, speaking through Justice Clark, says regarding the improper distinction made by the Public Service Commission of New York, First District, in refusing to allow anything for going value in the fair value of the property of the Kings County Lighting Company, a rate case:

"But 'going value' has been considered and allowed for in the following rate cases: *Missouri, Kansas & Texas R. R. Co. vs. Love* (C. C.), 177 Fed. 493, 496; *Shepard vs. Northern Pacific R. R. Co.* (C. C.), 184 Fed. 765, 810; *Des Moines Water Co. vs. Des Moines* (C. C.), 192 Fed. 193, 197; *Pioneer Tel. & Tel. Co. vs. Westenhaver*, 29 Okl. 429, 118 Pac. 354, 38 L. R. A. (N. S.) 1209.

"I am unable to perceive a logical difference between allowing 'going value' in the valuation of a plant when it is to be taken entirely by the public and allowing the same element when valuing the same plant for rate-making purposes. In each case the thing to be done is the fair appraisement of present value. What difference in principle can there be because in one instance all is taken for the use of the public and in the

<sup>1</sup> 192 Fed. 197.

other the public limits the earnings? In the case at bar the Commission says it 'disallowed this claim in determining fair value. \* \* \* But did consider it in fixing the rate of return.' If so, there is no proof of that fact in the record."<sup>1</sup>

The counsel of the New York Commission in arguing on appeal, before the Court of Appeals, in the Kings County Lighting Company case above referred to, criticises the opinion of the Supreme Court of the State, and says:

"A serious misconception appears in the following quotation from the opinion of the Court below (Vol. A, fol. 42):

'I am unable to perceive a logical difference between allowing "going value" in the valuation of a plant when it is to be taken entirely by the public and allowing the same element when valuing the same plant for rate-making purposes. In each case the thing to be done is the fair appraisement of present value. What difference in principle can there be because in one instance all is taken for the use of the public and in the other the public limits the earnings?'

"It is fair to say that there has been some confusion in the authorities because a principle which distinguishes purchase cases from rate cases has not always been clearly apprehended."<sup>2</sup>

Continuing, the eminent counsel says that this distinction between allowing going value in purchase and rate cases is illustrated and enforced by the decision of the Public Service Commission of New York, Second District, in the Cataract Power & Conduit Company case, which states:

"I think it must be taken as clear upon principle that there is a fundamental distinction as to going concern value between rate cases and cases of purchase."

The Higher Court of Appeals speaking through Judge Miller, quotes the above opinion of Justice Clark, of the Supreme Court, adding:

"we concur fully in what he has said on the subject and in his conclusion."

These clear-cut expressions of opinion upon this particular point, have great weight, as, perhaps, never before has it been so definitely and clearly put up to any court to pass upon the question of whether going value should be disallowed in rate cases

<sup>1</sup> *People ex rel. Kings County Lighting Co. vs. Wilcox et al.*, 141 N. Y. Supp. 677.

<sup>2</sup> Brief of George S. Coleman, Counsel of the Public Service Commission, First District, before Court of Appeals, State of New York, page 25.

in contradistinction to its allowance in sale cases. The subject was presented to the court as one of four questions, certified for review in the following explicit form:

"Was the relator entitled, upon the facts shown in the record, to have the Commission make an allowance for going value in determining the value of the relator's property used in the public service?"

The decision of the courts in the matter of allowing going value in both rate and sale cases, would seem to be in line with common sense, as no ordinarily intelligent investor would consent to pay for going value as part of the purchase price of property, and then, precluded by the decision of a Commission in a rate case, be satisfied to go without any return upon that part of his investment in the property which represented going value.

The Oklahoma Supreme Court in the Pioneer Telephone rate case carefully considered the question whether going value should be allowed in a rate case, and very ably sums up the whole situation in the following extract from that decision:

"There is no contention that any value on account of unexpired franchise or for good will should be added to the reproductive value, in order to ascertain the present value; but it is contended that, by reason of the fact that appellant's plant has an established system of operation, has at present customers sufficient in number to pay the operating expenses and annual depreciation and some profit, it has a value beyond the mere cost of reproducing the plant. This element of value contended for has been generally referred to by the authorities as 'the going-concern value' or 'going value.' No case from the Supreme Court of the United States involving the reasonableness of rates or charges, wherein this question has been considered by that court, has been called to our attention. In *Knoxville vs. Knoxville Water Co.*, *supra*, the lower court added to the appraisalment of the physical properties the sum of \$60,000 for going concern value. The Supreme Court assumed, without deciding, that this item was properly added. There are many cases wherein the fair market value of public service property was involved, under franchises reserving to the municipality the right to purchase the plant at or after a stipulated time for the fair market value thereof. These cases, so far as we have been able to examine them, uniformly hold that, in the absence of a provision in the franchise to the contrary, the going concern element of value must be considered in ascertaining the fair value of the plant. \* \* \* For the purpose of taxation, it is well established that this element of value must be included in assessing the property. \* \* \* Whether, however, all matters which are considered

in the foregoing two classes of cases as part of the going value, for the purpose involved in those cases, should be considered in determining the value as a basis for rate-making is not necessary to determine in this case. It is apparent \* \* \* that a complete telephone plant without a single subscriber, or with but few subscribers, is less valuable, both to the owner of the plant and to the members of the public it serves, than the same plant with a larger patronage. The more people a subscriber can communicate with over the telephone exchange, the more service, as a general rule, is such exchange to him; and it is only when such exchange has subscribers that the property of the owner invested therein has an earning power. But subscribers are not obtained without expenditure of money, labor, and time, during which the capital invested in the plant earns nothing, and often fails to pay operating expenses. The customers must be connected with the system of the plant; trained employees must be obtained; and a system of operation must be established. Few industries, if any, involving an investment of \$90,000 or more can be made self-sustaining from the first day of their operation. The uncontradicted evidence in this case discloses that appellant's plant, for the years preceding the first hearing, failed to produce revenue sufficient for operating expenses, current repair, and lay aside an amount for depreciation. During the time of development, there is a loss of money actually expended and of dividends upon the property invested. How shall this be taken care of? Must it be borne by the owner of the plant or by the initial customers? Or shall it be treated as part of the investment or value of the plant, constituting the basis upon which charges shall be made to all customers who receive the benefits from the increased service-rendering power of the plant by reason of these expenditures? It seems that the last solution is the logical, just, and correct one. If rates were to be charged from the beginning so as to cover these expenditures and earn a dividend from the time a plant is first operated, the rate to the first customers would be in many instances, if not in all, so exorbitant as to be prohibitive, and would be so at the time when the plant could be of least service to them. On the other hand, the public cannot expect as a business proposition, or demand as a legal right, that this loss shall be borne by him who furnishes the service, for investors in public service property make such investments for the return they will yield; and if the law required that a portion of the investments shall never yield any return, but shall be a total loss to the investor, capital would unwillingly be placed into such class of investments; but the law, in our opinion, does not so require. Private property can no more be taken in this method for public use without compensation than by any other method. When the use of the property and the expenditures made during the non-expense-paying and non-dividend-paying period of the plant are treated as an element of the value of the property upon which

fair returns shall be allowed, then the burden is distributed among those who receive the benefits of the expenditures and the use of the property in its enhanced value. \* \* \* All the evidence of appellant is that the going concern value of the plant in this case is equivalent to 20 per cent. of the reproductive value. This evidence is not contradicted by the state, the position of counsel for the State and of the Commission being that, whatever its amount is, it is not an element of present value forming a basis for the earning of rates. Twenty per cent. of the reproductive value is \$18,926.73, which, added to the reproductive value of the physical properties found by the Commission, makes a total present value, on which appellant is entitled to receive a fair return, in the sum of \$113,560.42."<sup>1</sup>

Without here referring to the many cases of valuation for purposes of sale in which going value has been recognized and allowed as a substantial portion of the total value of the property under consideration, the following decisions by the courts recognizing going value in rate cases may pertinently be quoted.

As early as 1893, Judge Brewer of the Supreme Court rendered a decision which may be said to foreshadow the general rule with regard to going value. The case involved the assessment of a railroad property in Indiana for tax purposes, and antedates the rather famous condemnation case of the National Water-works Company vs. Kansas City by one year.

"The true value of a line of railroad is something more than an aggregation of the values of separate parts of it, operated separately. It is the aggregate of these values plus that arising from a connected operation of the whole, and each part of the road contributes not merely the value arising from its independent operation, but its mileage proportion of that flowing from a continuous and connected operation of the whole.

\* \* \* A notable illustration of this was in the New York Central Railroad consolidation. \* \* \* Immediately upon the consolidation of these companies, and the operation of the property as a single, connected line of railroad between Albany and Buffalo, the value of the property was recognized in the market as largely in excess of the aggregate of the values of the separate properties. It is unnecessary to enter into an inquiry as to the causes of this. It is enough to notice the fact."<sup>2</sup>

The U. S. Supreme Court in affirming a decision of the Supreme Court in Ohio, in a tax case, held that the organism created by tangible property was a thing of value far in excess of the value of the tangible units.

<sup>1</sup> Pioneer Telephone & Telegraph Company vs. Westenhaver, 118 Pac. 359.

<sup>2</sup> Cleveland C., C. and St. L. R. Co. vs. Backus, 154 U. S. 444.

"In the complex civilization of to-day a large portion of the wealth of a community consists of intangible property" (page 218).

"Whenever separate articles of tangible property are joined together, not simply as a unit of ownership, but in a unity of use, there is not infrequently developed a property, intangible though it be, which in value exceeds the aggregate of the value of the separate pieces of tangible property" (page 219).

"In conclusion let us say that this is eminently a practical age; that courts must recognize things as they are and as possessing a value which is accorded to them in the markets of the world" (page 225).<sup>1</sup>

In the Knoxville rate case, already referred to, where the master had included \$10,000 for "organization, promotion, etc.," and \$60,000 for "going concern," the Court in reviewing the master's report says, with regard to the allowance for going value:

"The latter sum we understand to be an expression of the added value of the plant as a whole over the sum of the values of its component parts, which is attached to it because it is in active and successful operation and earning a return. We express no opinion as to the propriety of including these two items in the valuation of the plant, for the purpose for which it is valued in this case, but leave that question to be considered when it necessarily arises. We assume, without deciding, that these items were properly added in this case."<sup>2</sup>

While the decision of the Supreme Court, reviewing the decision of the Iowa Court in the Cedar Rapids Gas rate case, is not as explicit as might be desired, the element of going value was held to be properly included as a part of the total value upon which the corporation was entitled to a fair return, as discussed in preceding pages and shown by the extract from the Court's decision, as follows:

"Then again, although it was argued that the Court excluded going value, the Court expressly took into account the fact that the plant was in successful operation. What it excluded was the good will or advantage incident to the possession of a monopoly, so far as we might be supposed to give the plaintiff the power to charge more than a reasonable price."<sup>3</sup>

The Federal Court in granting an injunction against rates fixed by the Railroad Commission of Texas held that the valuation of the railroad property was defective in making no allowance for "established business," and adds:

<sup>1</sup> *Adams Express Co. vs. Ohio*, 166 U. S. 185.

<sup>2</sup> *City of Knoxville vs. Knoxville Water Co.*, 212 U. S. 9.

<sup>3</sup> *Cedar Rapids Gas Light Co. vs. Cedar Rapids*, 223 U. S. 669.

" \* \* \* and a system of rates and charges that looks to a valuation fixed on so narrow a basis as that shown to have been adopted by the Commission, and so fixed as to return only a fair profit upon that valuation, and which permits no account for betterments made necessary by the growth of trade, seems to me to come clearly within the provision of the fourteenth amendment to the Constitution of the United States, which forbids that a State shall deprive any person of property without due process of law, or deny any person within its jurisdiction the equal protection of the laws. \* \* \*

"The estimate made on behalf of the railroad in this case of the cost to that company and to its predecessor company of the railroad property, and the business of that company as it exists to-day, may not be exactly accurate—clearly it is not exactly accurate, but it seems to me that it is not beyond the fair value of the property, as it is shown to have been built up and constituted, and to exist to-day as a going business concern."<sup>1</sup>

The Federal Court in a case brought by the receiver of the U. S. Circuit Court for the Southern District of Ohio, to compel the City of Urbana to pay rates sufficiently high to cover a reasonable value of the services rendered in furnishing water, in determining what the property was reasonably worth as a basis upon which to determine rates, said:

"It is well established that fair compensation for such services includes operating expenses, taxes, cost of administration, and a fair yearly allowance for the maintenance of the plant and such return on the value of the capital and property employed as is just and reasonable. Upon consideration of the testimony of the experts, Hays, Williams, Mead and Hill, I am of the opinion that the fair reproduction value of the property is \$155,000, to which should be added \$25,000 as the 'going value' of the property."<sup>2</sup>

In a suit to enjoin the enforcement of the passenger rate of 2 cts. per mile and certain freight rates in the State of Oklahoma, temporary injunction was granted, the Circuit Court Judge holding on the subject of going value that:

"An established railroad system may be worth more than its original cost and more than the mere cost of its physical reproduction. It has passed the initial period of little or no return to its owners which, of greater or less duration, almost always follows construction and is not infrequently marked by default and bankruptcy. The inevitable errors in its building which finite minds and hands cannot avoid have been

<sup>1</sup> Metropolitan Trust Co. vs. Houston & T. C. R. Co., 90 Fed. 688.

<sup>2</sup> C. H. Venner Co. vs. Urbana Water-works, 174 Fed. 352.



measurably corrected, time and effort have produced a commercial adjustment between it and the country it was intended to serve; relations have been established with patrons, and sources of traffic have been opened up and made tributary. In other words, the railroad, unlike one newly constructed, is fully equipped and is doing business as a going concern. It has attained a position after many experiences common to railroad enterprises which entail loss and cost not paid from current earnings, and which correspondingly make for value."<sup>1</sup>

In a case brought by the Water Company to enjoin enforcement of an ordinance fixing water rates in the City of Des Moines, the Court confirming the substantial allowance of the master for going value says:

"The master has found and fixed a valuation upon this property, as a going concern, as distinguished from the naked plant. As to this, both reason and authorities sustain him. Everything of a business character is thus valued. \* \* \* A telephone system may have its wires, but before the business can be profitable it must have patrons."<sup>2</sup>

A fuller quotation of this Court's decision has been given in the preceding pages. The basis for allowing going value as found by the master, and the reasoning of the Court commends itself for its fairness and logic.

In the gas rate case in the City of Des Moines action was brought to enjoin the enforcement of an ordinance on the ground that the rates as fixed were confiscatory. The master in fixing the value of the plant found a substantial amount for going value, which finding was sustained by the Federal Court, which said:

"A 'good will' and a 'going concern' value are often confused and used interchangeably, and I am inclined to believe that in some instances the master's report is subject to this criticism. But whether this is so or not is not of much importance, as it is more of a verbal criticism than a practical one. Under the authorities cited, as well as others easily found from those cited, a 'good will' value, by reason of being a monopoly such as a gas company has under an ordinance, is not to be reckoned. The item of \$300,000 for 'going value' is quite important in this case. It is contended that if this \$300,000 must be added and the consumption of gas remains the same, and the percentage of dividends allowed by the master should stand, there will then be a shortage. The authorities already cited, and which in my opinion are in accord with good sense,

<sup>1</sup> Missouri K. & T. Ry. Co. vs. Love, 177 Fed. 496.

<sup>2</sup> Des Moines Water Co. vs. City of Des Moines, 192 Fed. 197.

favor the allowance of a 'going value.' Every kind of business, with no exceptions, has a value known as 'going value,' and such 'going value' is in no way connected with the monopoly or 'good will' value."<sup>1</sup>

Upon granting a preliminary injunction enjoining the Public Service Commission of Arizona from putting into effect rates it had fixed, based upon values it had found for the gas and electric properties of the Phoenix Gas & Electric Light Company excluding any allowance for going value, the Court said:

"As has been stated, this is the valuation of a going concern as distinguished from the bare bones of the corporation. The courts recognize a difference between the value of a plant of this character, without customers or business, and a plant that has been fully established and connected up with a municipal lighting system and with the houses, business places, and factories of regular customers. The present corporation was in August of last year a going concern; it was connected up with the municipal lighting system, the houses, business places, factories and other institutions of a prosperous community, and there was nothing more to do except to deliver the service, for which the corporation was fully and efficiently equipped. We think this element of valuation should be considered in connection with the other elements of valuation with the view of determining the actual present value of the whole plant."<sup>2</sup>

The Contra Costa Water-works rate case is sometimes cited as holding against any allowance for going value, whereas an examination of the facts shows that the Court apparently held that the evidence interpreted or viewed by the Court was not sufficient to warrant allowance for going value, but the Court at the same time stated it did not want to be understood as holding in a water rate case that anything should be allowed for going concern. A different presentation of the facts and upon the submission of proper evidence the Court will, no doubt, fall in line with practically all courts which have passed on this subject.

The decision of the Federal Court in the water rate case in San Francisco,<sup>3</sup> the decision of the Supreme Court of Oklahoma in the case of rates of the Pioneer Telephone Company,<sup>4</sup> and the decisions of the Supreme Court and Court of Appeals of New York

<sup>1</sup> Des Moines Gas Co. vs. City of Des Moines, 199 Fed. 204.

<sup>2</sup> Wm. P. Bonbright *et al.* vs. W. P. Geary *et al.*, 210 Fed. 44. Corporation Commission of Arizona *et al.*; Kelly vs. Same.

<sup>3</sup> Spring Valley Water-works Co. vs. City, *etc.*, of San Francisco, 124 Fed. 574.

<sup>4</sup> Pioneer Tel. & Tel. Co. vs. Westenhaver, 118 Pac. 354.

State in the gas rate case of the Kings County Company<sup>1</sup> have been previously referred to and quoted from at length so that they need not here be further cited.

The recent decision of the United States Supreme Court in case of the Des Moines Gas Company is of particular interest. The conclusions of the master, Judge Sloan, and the confirming decision of the District Court allowing going value in this rate case, have been referred to on the second preceding page. The Supreme Court sustained the lower court and refused to grant an injunction against the rates provided by the city ordinance. Judge Day, who wrote the opinion, after noting that the master had given very thorough consideration of the subject, stated that:

"Before considering the correctness of the rulings of the master and their confirmation by the district court, it is proper to notice that there is considerable difference between counsel as to what the master actually found, as to whether he included the sum of \$300,000 which he was disposed to allow for going value in the \$2,240,000 valuation found by him, or whether it was added to the estimate of the value of the property already made by him. We think the master intended to value the property at \$2,240,000 exclusive of the \$300,000 which, as we have said, he was at first disposed to allow for going value, and also that he deducted, in reaching the \$2,100,000, the \$140,000 claimed by the Gas Company as a proper allowance because of the cost of removing and replacing pavements, as above stated. We think, too, that it was the master's conclusion that, if the \$300,000, which he was at first disposed to allow, as stated, or the \$140,000 for paving, were included, the valuation of the plant would be such that a fair return could not be made upon the value of the property, and therefore the company would be entitled to a decree in its favor. It therefore follows that the determination of the correctness of the decree below, confirming the master's report, depends upon and requires a consideration of these two items."

Then the Court, after stating that the master was at first disposed to allow \$300,000 as a separate item to cover going value, quotes his excellent statements on going value as follows:

"It may be asked upon what basis this amount is determined. The evidence, followed strictly, might require me to make it higher, could my mind rest satisfied that the 'going value' of this concern is worth more, but I cannot feel satisfied that such is the case, and regard \$300,000 as every dollar it is worth over and above its physical value, and in my judgment, it is worth that much more than a plant would be that had to

<sup>1</sup> Kings County Lighting Co. vs. Wilcox *et al.*, Public Service Commission, 156 App. Div. 603, 210 N. Y. 479.

develop its business. But that would be much more rapid, in my judgment, than is estimated. I think a purchaser would be willing to add this amount for its developed business, and that a seller would not be willing to sell unless he got that much more than its physical value, but I could not give the mental process by which this conclusion is reached any more than a jury could do so, under like circumstances, but it is nevertheless my judgment under all the evidence in the case.

"The element of 'good will' as applied to the ordinary merchant or manufacturer dealing with the public generally is not considered in estimating the 'going value' of complainant's plant. It cannot be considered in a public utility like the one in question in this case, because the complainant has a monopoly of the business in which it is engaged in the city of Des Moines, and those who desire to use its product must buy of it. They have no choice in the matter. But there is a great difference even in a monopoly which has a business already developed and one that must develop it. The plant of complainant has all its parts working in harmony, performing their several functions in producing and conveying the gas to its customers. These several parts are not only in place, but have been brought to a harmonious operation throughout. Even the employees of the concern are familiar with their duties and experienced in performing them. But without business, no matter how perfect it may be, it would be unprofitable. It is ready, however, for business, and has the business to transact. It was a small concern at the start in 1864, but its books show that it has had a steady growth for many years in the past, and everything indicates that it will continue in the future. There is great difference between such a plant and one whose business must be developed. All a purchaser of such a plant would have to do would be to take charge of the plant, 'touch the button,' and he is making money from the start. There is no element of uncertainty connected with it.

"He can retain its experienced employees as a rule, should he so desire, at the same wages. There is no question that such a plant has a 'going value,' because it is a money maker from the start.

"The only difficulty is to determine how much its 'going value' is worth. No interest during its construction is allowed, nor anything that is included in the 'overhead charges,' which are part of the physical value. But simply the fact that it has a developed business that will make money for its owner, with reasonable rates allowed for the product which it manufactures and sells.

"That 'good will,' in the sense in which that term is generally used as indicating that element of value which inheres in the fixed and favorable consideration of customers, arising from an established and well-known and well-conducted business, has no place in the fixing of valuation for the purpose of rate-making of public service corporations of this character, was established in *Willcox vs. Consolidated Gas Co.*, 212 U. S.

19, 52, 53 L. ed. 382, 399, 48 L.R.A. (N.S.) 1134, 29 Sup. Ct. Rep. 192, 15 Ann. Cas. 1034.”<sup>1</sup>

Judge Day, himself, then discusses “going value,” as follows:

“That there is an element of value in an assembled and established plant, doing business and earning money, over one not thus advanced, is self-evident. This element of value is a property right, and should be considered in determining the value of the property, upon which the owner has a right to make a fair return when the same is privately owned although dedicated to public use.”

Thus far, we can agree with what has been said in regard to going value, but at this point in his opinion, Judge Day seems to confuse “going value” with “overhead charges,” for which latter item

“the master allowed 15 per cent. upon the base value (exclusive of real estate) or \$296,254, in addition to his allowance of \$6,923 for organization expense.”

The master, apparently, had clearly in mind the fact that “going value” was separate and distinct from “overhead charges” or “organization expenses,” which he specified covered expenditures for promotion, engineering, superintendence during construction, insurance, contingencies, administration expenses, interest and taxes during construction, definitely adding

“no overhead charges that do not adhere in and add to the cost thereof, should be allowed as a part of its (the plant’s) physical value.”

The Court, apparently overlooking this clear statement of the master, confuses the allowance for these items with “going value,” as indicated by the following:

“In this case, what may be called the inception cost of the enterprise entering into the establishing of a going concern had long since been incurred.”

\* \* \* \* \*

“These items of expense in development are often called overhead charges, for which, as we have already seen, the master allowed 15 per cent. upon the base value.”

Then Judge Day, states that, in line with the Cedar Rapids case,<sup>2</sup> when

“the value of the property fixed as the master certifies upon the basis of the plant in successful operation and overhead charges have been

<sup>1</sup> Des Moines Gas Co. vs. City of Des Moines *et al.* 35 Supreme Ct. Rep. 811.

<sup>2</sup> Cedar Rapids Gas Light case vs. Cedar Rapids, 223 U. S. 655.

allowed for the items and in the sums already stated, it cannot be said, in view of the facts in this case, that the element of the going value has not been given the consideration it deserves,"

thereby indicating that, in his opinion, the value of the property as found by the master included going value, the basis of his opinion being the following figures of the master:

Working capital.....	\$ 140,000
Real estate.....	150,000
Reorganization expenses.....	6,923
Meters in stock.....	6,603
Present value of physical property aside from above items.....	1,937,402
Total physical value.....	\$2,240,928

From the statement of Judge Day, given at the top of page 199, he evidently recognizes that going value is an element of value in the property of a public utility, over and above the value of the structural plant, and thought he was allowing such going value when he was allowing "overhead charges" and "organization expenses" which, of course, was not the case as clearly shown by the master. The principal conclusion to be drawn from the Des Moines Gas case therefore is not whether going value was allowed in the figures representing the value of the property accepted by the Supreme Court, but rather, whether the Supreme Court recognized going value as an element of property value and thought it was allowing such value in sustaining the figures fixed by the master. There can be no question but that Judge Day thought he was basing his opinion and the decision of the Supreme Court upon a value which included going value and, even though he erred in this, the principle that going value will be recognized and allowed by the Supreme Court still stands, unaffected by the Des Moines case.

**Going Value, Four Meanings.**—Although going value is used as indicating a value of utility property which exists in addition to that of the mere physical or structural property, the term is employed loosely to indicate quite different intangible elements. The various shades of meaning may be grouped into four general classes.

*First:—Expenses.*—A value based on the cost or estimated cost of making a complete physical plant into an income producing property. This idea of going value is based on actual expendi-

tures which have been made in attaching the business, securing customers, advertising, free equipment or services furnished consumers, perfecting organization and *esprit de corps* among employees, and those other items which necessitate extra expense in originating and creating a live property. These expenses are not in reality a part of regular operating expenses but rather they are costs which are incurred but once in the development of any given original business. They are quite distinct from such costs as fuel and labor, which may create a deficiency in operating a property that has small or inadequate returns during the early years but which operating expenses must necessarily be incurred in order to permit the corporation to build up that ultimate business which warrants the existence of the corporation itself. Under present methods of public service regulation accounting, it is possible to ascertain the exact cost of the class of items herein referred to as constituting the elements from which going value is ascertained, but heretofore, with less exacting requirements of bookkeeping, the experience of experts and operators of utilities has been taken in fixing this intangible value. Based on experience and a knowledge of the amount of money which corporations are willing to expend in order to obtain a given revenue, one-half or even the whole amount of annual gross revenue has been taken as the measure of going value.

"In the writer's experience, going concern value has usually been found to be between the net and gross income of the plant for a period of one year (at the date of taking). It may be largely effected, however, by the period required for the development of the business."<sup>1</sup>

Based on the cost of soliciting, connecting up and getting ready to supply a customer, a certain fixed sum per service, somewhat frequently taken at \$30 per meter in gas works, has been given as an arbitrary but fair basis for determination of going value. Still another rule of thumb method is to take a per cent. of the value of the physical plant as representing going value, these percentages vary from about 10 per cent. up to as high as 50 per cent. or even 75 per cent. and are based on knowledge of the cost of obtaining a revenue for different properties under various conditions of installation and operation.

An authoritative statement as to the proper method of determining going concern value, in a particular case says:

<sup>1</sup> Mr. Leonard Metcalf, in the *Transactions* of the Amer. Society of Civil Engineers, paper No. 1106, page 31.

"This being the cost of developing the business and efficiency of the company from the beginning of operation up to the present stage. Figures for determining it exactly in this case are difficult to obtain.

"In some other cases when steam plants constructed under normal conditions were operated and when the development was made without unusual difficulties, it has been found from records and experience that going concern value equals approximately 25 per cent. of plant value.

"As in such cases the physical plant values are ordinarily about four times the gross earnings, the amount of the gross earnings then coincides approximately with going concern value, and as going concern value will ordinarily be more closely related to gross earnings than to plant values, the going concern value may be said to be approximately equal to the amount of the annual gross earnings at the time of appraisal, provided proper judgment has been exercised in the development and operation of the property."<sup>1</sup>

These somewhat approximate and somewhat arbitrary methods of fixing going value have been frequently recognized and accepted by courts and commissions. In the Passaic Gas case, the Board of Public Utility Commissioners of New Jersey accepted the testimony of one of the experts and allowed 30 per cent. of the structural value, including therein certain items which are usually not included as a part of the going value.

"We are impressed with the evident solidity of Mr. Royce's testimony as to the ratio of going value to structural value. In order that there may be no mistake as to what he includes in going value, his own definition, explicitly asked for as a definition, should be recorded as given on page 1425 of the evidence. It includes practically all elements of value which the company may possess outside of its actual structural value and the intangible worth or value of its quick assets.

"Asked explicitly by Judge Armstrong: 'You include in that whatever value would attach to the franchise value of (or?) advantage for the value of a going business, a live business, producing a profit; the prospective increase, and the opportunity for the investment of additional capital in enlargements, and all that would you?' Mr. Royce answered, 'Yes, sir, and the value that comes, when a plant is properly handled, of getting the apparatus itself into such shape that it may be worked at its point of greatest efficiency. \* \* \*' (Evidence, pages 1425, 1426.)

"Recalled, Mr. Royce, being asked if his compilation of costs takes into account 'the preliminary costs of the party which went to look over the

<sup>1</sup> Testimony of W. H. Blood, pp. 919, 920, before the Public Service Commission of the State of Missouri, in *McGregor-Noe Hardware Co. vs. Springfield Gas & Electric Co.*, 1913.



field and of organizing the business or of getting their franchises,' he replies that he is speaking of 'the company ready to do business,' but adds, correcting himself or explaining himself, that it applies 'either before or after' the construction of the plant (Evidence, page 1789).

"We must bear in mind the definition given by Mr. Royce himself, when asked specifically to define the term 'going value,' as 'practically all the elements of value which the company may possess outside of its actual structural value and the tangible worth or value of its quick assets' (Evidence, page 1425). With this definition of 'going value,' we must compare his matured statement that he would say 'without any question that the minimum of the going value of the property would be the sum of those three items, or perhaps 30 per cent. of the structural value of the plant; and roughly speaking and considering that we are to take up a new proposition of this kind I think we should have to spread that amount in the variation of the going value' (Evidence, page 1787).

"Structural value, according to Mr. Royce, includes contractor's profit on structures. His estimate of 30 per cent. moreover is a minimum (Evidence, page 1787); but 'for purposes of this kind that would be a fair basis' (Evidence, page 1862). He testified out of a wide experience that this is a fairly common or average allowance for going value. He testified that in the case of this particular company:

'I believe that the actual cost of developing, of getting the new business and of creating efficiency in operation; together with some losses, during the various periods of construction, has been at least 30 per cent. of the actual structural cost.'

"He was unshaken on cross-examination, and made clear that this percentage applied not merely to the structural cost with which a company might start in business, but to the structural cost of extensions as well (Evidence, page 1849). He is also on record that this value of going concern does not suffer depreciation (Evidence, page 1865), but is fully as stable as real estate (Evidence, page 1866). In the absence of accounting records going back more than about a dozen years, and in view of the very wide expert experience of underlying and supporting Mr. Royce's testimony, we incline to think that 30 per cent. of present structural value, new, may well be taken as a fair presumptive measure of the total going concern value of the company. This 30 per cent. is to be taken on the fair structural value, new, of the company's plant and distribution system, working capital being excluded."<sup>1</sup>

Similarly the Oklahoma Supreme Court added 20 per cent. to the "reproductive value" of the physical properties as found by the Oklahoma Corporation Commission in overruling that Com-

<sup>1</sup> Hearing on Rates of the Public Service Gas Company, before the board of Public Utility Commrs., Dec. 26, 1912, page 42.

mission and establishing the correct value upon which to fix rates.<sup>1</sup>

The special master in the Des Moines Water Company case fixed the going concern value at practically 10 per cent. of the physical value of the property,<sup>2</sup> and other similar instances might be cited.

While proper weight must be given to the testimony and experience of men qualified to speak on the subject, this method of determining going value is not always as satisfactory to some minds as certain other methods which can be worked out with greater mathematical exactness. Moreover, it will be recognized that the ratio of going value to the cost of physical property is not constant under varying conditions such as the comparatively high price of labor and materials in one property, as against the low cost of these elements in another property, or the saturation of the territory as against the undeveloped business of a second corporation or the investment required in one class of utility property which may be relatively large per dollar of revenue, as compared with the investment required by another utility of an entirely different type.

*Second.—Deficiency.*—Going value has sometimes been defined by the use of the term “development expenses,” meaning the deficiency in revenue to provide operating expenses and fair return, which deficiency accrues in practically every utility during the first few years of operation, while the business is being attached and the revenue built up to a point that justifies the existence of the utility. Where information is lacking as to the actual deficiency in the amount heretofore earned, as compared with the amount which should be earned in order to make a fair return to the utility on the value of its property, existing going value may be estimated by computing the similar loss that would accrue to a utility assumed to begin construction of its plant at the present time, compared with the actual revenue of the existing plant. The condition is almost inconceivable that any public utility corporation can earn a fair return upon the value of its property from the very first day it is started. Comparatively few corporations have been able to earn a gross income even for the first year, in which complete operation begins, that is, sufficient to provide operating expenses, taxes and a fair return upon the in-

<sup>1</sup> Pioneer Telephone & Telegraph Co. vs. Westenhaver, 118 Pac. 354.

<sup>2</sup> Des Moines Water Co. vs. City of Des Moines, 192 Fed. 193.

vestment. One of the single notorious instances of this class was the subway in New York City, which being financed largely on municipal credit, has relatively low fixed charges.

The fairness and appropriateness of recognizing, as a part of the cost of a property, the expense of constructing the business apart from and in addition to the physical property is not a new or modern idea.

At least 70 years ago, in 1845, Asa Whitney made a definite estimate of the probable development cost, or deficit in fair return, of the Northern Pacific Railway.<sup>1</sup>

The Railroad Commission of Wisconsin early recognized the fact that:

"New plants are seldom paying at the start. Several years are usually required before they obtain a sufficient amount of business or earnings to cover operating expenses, including depreciation and a reasonable rate of interest upon the investment. The amount by which the earnings fail to meet these requirements may thus be regarded as deficits from the operation. These deficits constitute the cost of building up the business of the plant. They are as much a part of the cost of building up the business as loss of interest during the construction of the plant is a part of the cost of its construction. They are taken into account by those who enter upon such undertakings, and if they cannot be recovered in some way, the plant fails by that much to yield reasonable returns upon the amount that has been expended upon it and its business. \* \* \*

"The cost of developing a business of water-works may be made up of many different kinds of expenditures. It may include the cost of advertising, soliciting, demonstrations showing the advantage of having water under pressure in the houses, of making free connections, of the granting of lower than the regular rates, and of many other outlays of this character in order to secure customers. It may also include losses to the investors because of the fact that the plant in their earlier years failed to earn enough to meet all the requirements for operating expenses, including depreciation and a reasonable return upon the investment. If the direct outlays for securing business are charged to operating expenses, as they should be, instead of to the capital account, then the cost of acquiring a paying business would be represented by the deficits, or by the amounts by which the gross earnings fall short of covering the cost of operation, as stated, including fair returns to the investors. \* \* \*

"It thus appears that the cost of building up the business of a plant is in most cases as unavoidable as the cost of the construction of the

<sup>1</sup> "Engineering and Contracting," Aug. 19, 1914, page 169.

plant itself; that when such costs are incurred, they must be reimbursed in some form by the consumers in order that capital may be secured; that such reimbursement is equitable as between investors and consumers; and that this is a just method of dealing with such costs for other reasons. If this is sound, it also follows that the cost of the business must also be taken into consideration in determining the value of the plants for rate-fixing purposes."<sup>1</sup>

The principles enumerated above have been adhered to consistently by the Wisconsin Commission in a large number of other decisions so that this method of measuring going value by past deficits has very generally become to be known as the "Wisconsin Method." More recently, this same Commission has given consideration and apparently based allowance for going value upon other lines of proof than the deficit method, namely, upon the comparative plant basis which is discussed hereafter. The Wisconsin or "deficit method" of estimating going value has been quite widely recognized and followed by other public authorities and courts. The Supreme Court of Wisconsin in a recent decision upheld the Wisconsin Commission in its allowance of going value to the Appleton Water-works Company based on the deficit method, although the physical property was not in the best of condition and the revenue was not sufficient to pay all operating expenses, an allowance for depreciation and a fair return on the value of the property.

Because of the fact that deficits always accrue at the start, the Oklahoma Court has definitely recognized that fact and stated such losses should be capitalized.

"Few industries, if any, involving an investment of \$90,000 or more, can be made self-sustaining from the first day of their operation. \* \* \* During the time of development there is a loss of money actually expended and of dividends upon the property invested. How shall this be taken care of? \* \* \* or shall it be treated as part of the investment or value of the plant, constituting the basis upon which charges shall be made to all customers who receive the benefits from the increased service-rendering power of the plant by reason of these expenditures? It seems that the last solution is the logical, just, and correct one."<sup>2</sup>

The Public Service Commission of New Hampshire has said:

"Technically, depreciation should be made good out of earnings. But it is out of the question for this company to make good out of its

<sup>1</sup> Hill vs. Antigo Water Co., 3 W. R. C. R. 623.

<sup>2</sup> Pioneer Telephone & Telegraph Co. vs. Westenhaver, 118 Pac. 354.

earnings a loss of \$250,000. We, therefore, find that justice to the company, and the public good alike, require that the deficiency in the present depreciated value of the company's property, below the amount actually invested by the stockholders, be regarded as a cost of developing the business and, as such, added to any depreciated value to determine the present fair value of the company's property devoted to the public service; and that the company should, hereafter, be allowed to earn annually a fair return upon \$1,402,750, the amount of its *bona fide* investment. \* \* \* "

"The present depreciated value of the property, excluding appreciation in land values, is \$1,050,000. There has, therefore, been a total depreciation of \$450,000 of which \$100,000 has been made good out of earnings, while the balance of \$350,000 remains a loss to the stockholders, unless it is in some way made good to them."<sup>1</sup>

The Court of Appeals of New York State has recognized and approved the deficit method for measuring going value.

"It takes time to put a new enterprise of any magnitude on its feet, after the construction work has been finished. Mistakes of construction have to be corrected. Substitutions have to be made. Economies have to be studied. Experiments have to be made, which sometimes turn out to be useless. An organization has to be perfected. Business has to be solicited and advertised for. In the case of a gas company, gratuitous work has to be done, such as selling appliances at less than a fair profit and demonstrating new devices to induce consumption of gas and to educate the public up to the maximum point of consumption. None of those things is reflected in the value of the physical property, unless, of course, exchange value be taken, which is not admissible in a rate case. The company starts out with the "bare bones" of the plant, to borrow Mr. Justice Lurton's phrase in *Omaha Water-works Case*, *supra*. By the expenditures of time, labor, and money, it coördinates those bones into an efficient working organism, and acquires a paying business. The proper and reasonable cost of doing that, whether included in operating expenses or not, is as much a part of the investment of the company as the cost of the physical property.

Investors in a new enterprise have to be satisfied as a rule with meager or no returns while the business is being built up. In a business subject only to the natural laws of trade, they expect to make up for the early lean years by large profits later. In a business, classified among public callings, the rate-making power must allow for the losses

<sup>1</sup> Report of P. S. Commission, State of New Hampshire No. D-159, Vol. II, No. 2, Nov. 20, 1914, page 90.

during the lean years, or their rate will be confiscatory, and of course will drive investors from the field.

\* \* \* \* \*

To view the matter in another aspect, take the case of a public service corporation with a plant constructed just ready to serve the public. It is going to take time and cost money to develop the highest efficiency of the plant and to establish the business. Three courses seem to be open with respect to rate-making, viz.: (1) To charge rates from the start sufficient to make a fair return to the investor and to pay the development expenses from earnings, a course likely to result in prohibitive rates, except under rare and favorable circumstances; (2) to treat the development expenses as a loss to be recouped out of earnings, but to be spread over a number of years, in other words, as a debt to be amortized—that involves complications, but would seem to be fairer to the public, and certainly more practical than the first; (3) to treat the development expenses, whether paid from earnings or not, as a part of the capital account for the purpose of fixing the charge to the public. The last course would seem to be fairest to both the public and the company, as well as the most practical.”<sup>1</sup>

The New York Court’s decision, as to going value, is based on a practical consideration of the way a public utility’s revenue is built up, but the following dicta in the same case to the effect that no going value exists in case of a successful corporation, is apparently neither good law nor good logic, as clearly shown by Judge Day of the Supreme Court in the recent decision of *Des Moines Gas Company* case, where Judge Day quotes and approves the following statement of the master: “There is no question that such a plant has a ‘going value,’ because it is a money maker from the start.”<sup>2</sup>

“Making proper allowance for the matters just considered and perhaps for others which do not occur to me, I define ‘going value’ for rate purposes as involved in this case to be the amount equal to the deficiency of net earnings below a fair return on the actual investment due solely to the time and expenditures reasonably necessary and proper to the development of the business and property to its present stage, and not comprised in the valuation of the physical property.

“It may be conceded that going value has no existence apart from tangible property and that commercially there is but one value, that of the property as a whole, but as the rate cannot be made to depend upon the exchange value, which would in turn depend upon the rate, it

<sup>1</sup> *People ex rel. Kings County Lighting Co. vs. Wilcox*, 210 N.Y., 479.

<sup>2</sup> *Des Moines Gas Co. vs. City of Des Moines, et al.*, 35 Supreme Court Rept. 811.

would seem to be necessary to appraise the physical property and the going value separately, and of course that is the case if the cost of reproduction rule be adopted.

"It remains to consider how 'going value' is to be appraised.

"Obviously, the most satisfactory method is to show the actual experience of the company, the original investment, its earnings from the start, the time actually required and expenses incurred in building up the business, all expenditures not reflected by the present condition of the physical property, the extent of which bad management or other causes prevented or depleted earnings, and any other facts bearing on the question, keeping in mind that the ultimate act to be determined is not the amount of the expenditures, but the deficiency in the fair return to the investors due to the causes under consideration. The business in this case was 20 years old, the books of the old company were not available, and it is of course problematical whether, if produced, they would have shown the necessary facts. The question, therefore, had to be determined, as all questions of fact have to be, by the best evidence available. Here, I may repeat, that mere difficulty in the proof would not justify a confiscatory rate. The value of the physical property was shown by opinion evidence as to the cost of reproduction. The same kind of evidence was given by two witnesses for the relator as to the cost of building up the business to its present state."<sup>1</sup>

The conclusion stated that going value "equals the deficiency in net earnings" would seem to assume that possibly large, past profits, declared as dividends, do not belong to the stockholders of that period and because such dividends were not put into the property to wipe out that part of the capital investment necessarily required to build up the business and revenue of the corporation, therefore the existing stockholders may now be penalized by reducing the value of their property to that merely of the structural plant. Or again, if by unusual opportunity, foresight and ability, the owners of a property have been able to wipe out the early losses incurred in creating the revenue, then the value of their property is to be that much less than the value of an identical property elsewhere, operating under ordinary conditions, with normal ability, the early losses of which have not been recovered.

If, on the one hand, the deficit theory of measuring going value is to be limited in its application—and very properly so—to the normal period in which the normal property will put itself upon a

<sup>1</sup> People ex rel. Kings County Lighting Co. vs. Wilcox, Court of Appeals, decision rendered Apr. 24, 1914. 210 N. Y., 479.

paying basis, thereby excluding the property which is unsuccessful or which takes an abnormally long period in which to prove itself a success, then, on the other hand, logically and fairly, the same normal measure of going value must be allowed the exceptionally successful corporation which puts itself on a paying basis in an abnormally short period. The normal cost of developing the business must be allowed as a part of the value of the property of the successful, or abnormally successful corporation just the same as that same normal cost would be allowed the unsuccessful corporation regardless of the fact that the actual cost may have been much larger than what is or what should be recognized as the normal cost of developing the business.

Criticism of the New York Courts' conclusions in the above quoted excerpt from the Kings County decision has been made by one of the most eminent legal authorities in rate questions, the late Mr. Chas. F. Mathewson, of New York, and is here quoted at length:

"In one respect I venture to disagree with the expressions of the learned Judge who wrote the opinion in the case last quoted.

"He defines 'going value' for 'rate purposes' as 'the amount equal to the deficiency of net earnings below a fair return on the actual investment' due to the expenditures reasonably incurred in the development of business and property of the company, in addition to the value of the physical property. I believe it to be the sound doctrine that such expenditure represents the value of the 'going concern' development, whether there is a deficiency in net earnings by reason of such expenditure or not. The language of the learned Justice, literally read, would indicate that there could be no 'going concern' value in the case of a corporation which earned a fair return on the investment from the beginning; and while the discussion may be academic because there is rarely found such a corporation, yet his proposition as quoted is believed to be unsound. Thus, a street railway system may be profitable and pay adequate dividends from the outset; and yet it takes years, as in the case of the Metropolitan System, and a large expenditure, to acquire the experience and knowledge of conditions and traffic and methods of operation which will produce the best results, which expenditures will not have to be repeated, which would not have been necessary had the management been omniscient at the outset, and the result of which is a fund of knowledge and efficiency for which a purchaser would gladly pay as part of the capital value of the enterprise. This knowledge and experience is just as valuable to the owner of the property, and forms just as important a part of the whole investment, whether the moneys



which purchase the experience and produce and develop the business comes from rates paid by consumers or from capital borrowed by the owner.

"If the company was permitted in default of regulation by the legislature to charge rates so high that it was able to pay excessive dividends to stockholders, as well as to meet the expenditures of this experimental period which produces the 'going concern value,' that was merely the good fortune of the stockholders. What they earned and paid to themselves in dividends belongs to them and cannot be taken away; and it does not in any way conflict with the proposition that the development of their business and the passing through the experimental period of its operation at a large expense, never to be repeated, produce an element of value in the whole business which is not dependent for its existence upon the source from which the moneys came which produced it, or the question as to whether it resulted in a curtailment of dividends while it was being developed. This we believe to be the view of the weight of authority."<sup>1</sup>

In this connection it should be noted that in the Passaic Gas case, where the Public Utility Commissioners of New Jersey have allowed practically 30 per cent. of the value of the physical property, including working capital, as an additional amount representing going value, the sum of \$4,750,000, being the value of the property upon which rates were fixed, the Supreme Court of New Jersey very properly upheld the conclusion of the Commission, to the effect that even if the costs incurred in developing the business had been paid for out of previous earnings, exacted from the consumers, nevertheless going value should properly be allowed in determining the present fair value of the property, on which rates should be fixed.

With regard to the use of early deficits as a measurement of present going value, it may justly be argued that it is not logical to use historic values in connection with present cost figures when the endeavor is to ascertain present value. Such criticism is fair if strict reproduction cost method is being employed, in which case it is better and more logical to determine going value based on an estimate using the revenue of existing plant, as has been done by the Wisconsin Commission for example in the Milwaukee Gas Company case.

The early deficit method is sometimes unfairly criticized, because if followed, without the limitation of reason and experience

<sup>1</sup> "Some Legal Aspects of Regulation of Public Service Corporations," by Charles F. Mathewson, May 11, 1914, page 24.

as to what are normal conditions, it leads to absurd results, in that an unprofitable business will have greater going value than one that is profitable from the start. As the Court of Appeals of New York has stated:

"It is urged that an unprofitable business will thus have a greater value for rate-making purposes than one profitable from the start.

"That again overlooks the fundamental consideration that a public service corporation is entitled to a fair rate of return from the beginning of its investment and no more. If the shareholders have been deprived of a fair return on their investment, because of the time and expense reasonably and properly required to build up the business, they have, to the extent of that deprivation, added to their original investment and are entitled to a return upon it."<sup>1</sup>

*Third:—Income.*—Going value is sometimes used to mean that value which is derived from a consideration of capitalizing net earnings.

"It would not have fulfilled its duty had it estimated the sum to be paid in view only of what the lands, buildings, pipes, wires, and other apparatus were worth, considered as separate items. They were to be valued in view of their arrangement for and adaptability to the purposes for which they were provided, and of their earning capacity as a going concern, in ascertaining which special regard was, by the terms of the statute, to be paid for their actual earnings."<sup>2</sup>

While good will is usually not considered an element to be recognized in valuing a public utility that is a monopoly, going value, that is evaluated from a consideration merely of net earnings, is in that sense closely allied to good will, and may perhaps be fairly applied in determining the value of the business of a private corporation but has no place in consideration of value upon which to base a fair return when considering a public utility corporation operating as a controlled monopoly.

Value determined from a consideration of net earnings is usually based principally upon the rate of interest, the degree of risk and the present and prospective earnings. Therefore, market value resulting ultimately from prospective net returns depends upon rates and, hence, cannot alone be used in fixing those rates. In cases of condemnation for purchase and sale, where rates are not

<sup>1</sup> Court of Appeals, State of New York, in *The People ex rel. Kings County Lighting Company vs. Wilcox et al.*, Composing Public Service Commission, First District, Mar. 24, 1914. 210. N. Y. 479.

<sup>2</sup> *Norwich Gas & Electric Co. vs. City of Norwich*, 57 Atl. 751.

under criticism, have not been shown to be unfair or perhaps have been approved or authorized by constituted public authorities, then in such cases the capitalization of net earnings may be used as one measure of going value. It would be the difference between the capitalized amount of the net earnings and the appraised value of the physical property, assuming the total value is covered by these two elements. As a matter of fact, the ascertainment of the two elements, going value and physical property, would be unimportant in case capitalized value alone is to be accepted as the fair value of the property being considered because the sum of these two elements would equal the capitalized value. If, however, it is desired to check the capitalized value by independent methods, the amount of going value, as the difference between the capitalized value and the value of the physical property, should be determined and compared with going value as found by the "deficit" or "comparative" methods.

The Privy Council, which generally corresponds to the Supreme Court in the United States, has more than once held that the earnings of a property must be considered in determining going value. The Hamilton Gas Company of New Zealand was formed under an act which gave the municipality the right to acquire the property of the gas works, upon paying, to use the language of the statute, what the "gas works and plant" were worth. The lower court found that the commercial value of the "gas works and plant" was, as a going concern, the sum of 31,382£, while if valued *in situ*, excluding the idea of going value, the property was of the value of only 13,539£. The question involved was, as to which of these two sums should be paid by the corporation. The company contended that the price to be paid for the gas works and plant "should be the commercial value thereof as a going concern," while the Hamilton borough contended that "the price should be merely the value of the gas works and plant regarded as gas works and plant *in situ*," and that this value should be arrived at "by taking the present value of the land and buildings and adding thereto what would be the present cost of the machinery and materials of a similar gas works and plant and of placing such gas works and plant *in situ*, and making good the ground and deducting the sum for depreciation." The Privy Council held unanimously,<sup>1</sup> Lord Shaw writing the opinion, that the company was entitled to be paid for its

<sup>1</sup> Hamilton Gas Company, Limited, vs. Hamilton Corporation, App. Cas. 300.

property as a going concern, thereby awarding for going value the difference between £31,382 and £13,539, or £17,834, or, as stated in dollars, approximately \$89,215, which is 132 per cent. of the physical value.

A similar case settled by the Privy Council of England from Western Australia involved the same principle as the preceding case. The City of Perth had, under the law, a right to acquire the property of the gas company at the expiration of six months after serving notice of its intention to purchase from the company "all the land, buildings, hereditaments, lamps, pipe, stock and appurtenances of and belonging to the company."

The question was whether, in buying the property, it was to be considered "as a going commercial concern," or whether the company was merely entitled to "the value of the physical property" in place. The Privy Council reaffirmed its ruling<sup>1</sup> of the previous year in the Hamilton case cited above, and held unanimously that going values must be allowed and that any other construction of the statute would work great injustice.

In determining rates for competing steam or electric railroads or other utilities, market value, that is, the value fixed from a consideration of earnings, has been used. The Public Service Commission of the State of Washington in finding the value of utility property is required by statute to take not less than market value as to true value of the property.

"When the commission shall have valued the property of any public service company, as provided for in this section, nothing less than the market value so found by the commission shall be taken as the true value of the property of such company used for the public convenience for the purpose of assessment and taxation."<sup>2</sup>

As present "fair value" may be more or less than the present "physical value," it is evident that the non-physical or intangible value should be determined in connection with a consideration of revenues. Public authorities when confronted with the problem of fixing rates based on the value of competing utility properties have assumed the same rates for both utilities, and occasionally fixed the rates high enough to earn a return on the larger capital investment, thus recognizing that the going value in the property requiring the smaller capital investment is due to its more favorable showing of earnings.

<sup>1</sup> Perth Gas Company, Limited, vs. City of Perth Corporation, App. Cas. (1911) 506.

<sup>2</sup> Washington Laws, 1911, ch. 117, par. 92.

In the *Kansas City Water-works* case, the Supreme Court said:

"The city steps into possession of a property which not only has the ability to earn, but is in fact earning. It should pay, therefore, not merely the value of a system which might be made to earn, but that of a system which does earn."

"The equal protection of the laws—the spirit of common justice— forbids that one class should by law be compelled to suffer loss that others may make gain. If the State were to seek to acquire the title to these roads, under the power of eminent domain, is there any doubt that constitutional provisions would require the payment to the corporation of just compensation, that compensation being the value of the property as it stood in the markets of the world and not as prescribed by an act of the legislature? Is it any less a departure from the obligations of justice to seek to take not the title but the use for the public benefit at less than its market value?"<sup>1</sup>

The market value theory as determining the fair basis of value for rate-making recognizes those elements inhering in utility property which cost or investment theory may fail to take into account. These elements include favorable location, investment under advantageous market conditions, superior operating management and business methods that produce large revenues per dollar of capital invested. Consequently, market value has many claims for consideration in rate-making and may be well used as a guide and measure in fixing the present "fair value" which ultimately may be determined.

If rates are to be based on physical cost alone, market value means nothing other than recognition of the rate at which capital is willing to invest, leaving no reward for the operators of the enterprise. If the rate of return upon the investment is made larger than requirements demand for the safest investment, then the market value will be greater than the actual cost. On the other hand, if the rate of return allowed is less than demanded by current capital, then market value will be less than physical cost. It is clear that in a case of a monopoly it is impossible to fix and determine reasonable rates purely from a consideration of market value which is itself determined by the rates. On the other hand, at the time public regulation of utilities is undertaken, it may be that market value is the proper point at which fair present

<sup>1</sup> *Reagan vs. Farmers' L & T. Co.*, 154 U. S. 410.

value should be fixed as a starting point. There is considerable prevalent opinion that market value is the proper basis in rate cases by which to fix the value even of deteriorated physical property, that is, property which has become very largely theoretically depreciated or has reached a condition which will soon require renewal.

*Fourth:—Comparison.*—Going value is also used to signify the present worth of the excess of earnings of an existing plant compared with those of a similar plant, starting anew at the date of the valuation. For lack of a better name and because based on a comparison, this meaning of going value is usually identified by the term “comparative plant” method. This use of the term going value is akin to its use as applied to the deficit method, for both rely on the same fundamental fact for determining the measure of going value, namely, the cost of building up the business and producing a revenue. In the deficit method, going value is usually fixed by a knowledge of the losses that have actually occurred in the past, in building up the present revenue-producing business; it is a historical method. The comparative plant method is strictly a reproduction method, being an estimate of the cost of reproducing the present revenue of an existing company under present conditions, the same as an estimate of the cost of reproduction of the physical property is made by considering the existing property constructed under present conditions at current costs. The deficit method of fixing going value and the original cost of physical property are both based on historical investigations, while the comparative method of ascertaining going value and the cost of reproduction of the physical property are based on present costs.

The comparative method endeavors to fix the deficit that would accrue in building up the business and revenue of a new plant equal to the revenue and business of the existing plant. In determining the amount of this deficit accruing in the comparative plant, the same period for construction of the physical property and the same other premises are used as are made the basis for fixing proper labor and material unit costs of the physical plant and in determining the length of time during which interest and taxes will accumulate, all of which principles and estimates are ordinarily determined without much controversy in making up the cost of reproducing the physical property. In the same way, based on similar knowledge and experience in

existing properties, conclusions are reached as to the period of time required to build up the business and revenue.

Explaining more in detail, it will be seen that to reproduce the revenue of an existing property, it would first be necessary to commence the construction of a physical plant similar in all respects to the existing plant and, thereafter, start to build up the business equal to the business of the existing property, a process which would take a considerable period of time. Thus, the same basis of reproduction cost of the physical property is used as has been obtained by the engineers making an inventory and an appraisal of the existing physical property. In the reproduction of such physical property there must be assumed a gradual expenditure for land, buildings and apparatus, commensurate with human limitations, as to the rate at which such property can be specified, purchased, erected and gotten into a condition for operation. This will require some time, at least one open season in smaller plants and several years in larger plants. As soon as sufficient plant has been constructed, it is assumed it would immediately begin operation and service to customers. The completion of the physical plant and the extension of the business go on as rapidly as possible, but as the development of business proceeds at a relatively slow rate, the entire reproduction of the physical property will practically always be completed considerably in advance of the acquisition of the revenue. The rate of acquisition of income is determined from a consideration of the business of the existing company, the rate at which it has been built up, the knowledge of local conditions and experience in the acquisition of business in other similar properties. After a reasonable period, the gross revenue will have been built up to an amount equal to that of the existing property; in the same way, the operating expenses will gradually have increased until they, too, equal those of the existing company. By comparing the figures of such acquisition of revenue and increase in operating expenses of the reproduced property with the similar figures of the existing property, during the period necessarily required for the reproduction of the physical plant and revenue of the reproduced property, the excess earnings may be ascertained. This excess, when ascertained year by year, is then discounted at a current rate of interest, so as to show the value of the excess earnings at the date of the commencement of the reproduction period, that is, at the date of the commence-

ment of construction of the physical property, which is taken as the date of the valuation, and the sum of these discounted net earnings of the existing plant—over those of the reproduced plant—is the going value of the existing plant. For a more detailed explanation of this method of determining the going value of an existing plant, the reader is referred to the discussion on going value in the author's book, "*The Valuation of Public Utility Properties.*"<sup>1</sup>

The comparative plant method of determining going value has been criticised because it does not fix a definite ratio between going value and gross revenue or physical property. Such criticism would seem superficial, as the ratio will depend upon specific conditions, for example, revenue and net income of a property will be greater in the case where the investment has been economically made or where the territory has been thoroughly worked, so as to secure a large amount of business per unit of investment, than in the case where the opposite conditions exist. Again, the investment in an electric plant, producing energy from water-power, will ordinarily be very much larger than for a plant with the same capacity using fuel as the source of energy. As indicating the lack of relation between going value and revenue or property values, the accompanying tabulation is reproduced, showing these values in certain water-works properties, as developed by Mr. John W. Alvord of Chicago. The averages, below the table, have been worked out by the author of this volume, for the eleven cities, indicated by stars, that more nearly compare in population.

The method has also been criticised because it always fixes some going value, greater or less, in all operating properties. But is it not evident that the actual existing business of a going property is always worth something more than the mere physical plant? It would cost something for a new company to secure that same business, even though the gross revenue were only sufficient to pay actual operating expenses. Hence, it is impossible for a going property to exist without having some going value, although the market value of the entire property, including its going value, in the case of sale, might be less than the present depreciated value of the physical property alone. The non-success of a utility as a paying property does not demonstrate there is no going value any more than the existence of such property

<sup>1</sup> See page 152, "*The Valuation of Public Utility Properties,*" by Henry Floy.



TABLE VI.—DATA OF VALUATIONS ON WATER-WORKS PROPERTIES  
(Located Largely in the Mississippi Valley)  
Lack of Relation of Going Value to Physical Property, Gross Income Connections  
John W. Alvord, C. E.  
Chicago

(Page 206—American Water-works Association—Proceedings, 1909)

Reference number	Popu-lation	Water mains, miles	Service number	Value production of physical property	Total depreciation	Net value physical property	Domestic revenue	Hyd. rentals	Gross revenue	Going value	Going value per cap.	Going value per service	Per cent. going value to net physical property	Per cent. going value to gross revenues
1*	11,269	8.5	600	95,260	24,010	71,270	21,800	4,200	26,000	18,860	1.67	31.40	26.5	72.5
2*	25,902	40.0	3,015	710,760	73,000	637,760	72,000	23,000	95,000	68,614	2.66	21.80	10.8	72.3
3*	35,200	60.0	6,000	1,384,700	178,000	1,206,700	123,000	24,000	147,000	243,430	6.90	40.60	20.1	165.0
4*	42,000	63.0	3,300	432,874	48,489	384,385	38,000	17,000	55,000	62,718	1.69	19.00	16.3	268.0
5*	14,450	28.2	1,922	235,336	22,336	213,000	169,000	11,100	28,000	41,500	2.87	21.60	19.5	148.2
6	6,070	11.0	500	103,600	25,940	77,660	11,600	3,300	14,900	8,961	1.48	17.90	11.5	60.3
7	2,215	13.0	225	92,540	13,230	79,310	9,100	3,400	12,500	17,800	8.04	79.10	22.4	142.0
8	6,400	10.2	350	115,060	8,400	106,660	13,340	1,836	16,176	10,274	1.61	29.30	9.6	67.8
9	4,100	9.0	166	89,800	9,500	80,300	8,700	3,750	12,450	12,830	3.12	77.40	16.0	103.0
10	3,050	9.0	400	92,520	14,970	77,550	12,400	8,000	20,400	23,862	7.84	59.60	30.5	116.0
11	38,469	45.0	6,217	686,100	59,800	626,300	17,000	2,000	19,000	(None allowed)				
12	155,540	229.2	16,491	6,441,117	740,333	5,697,784	387,961	117,936	505,897	562,512	3.62	34.10	9.9	111.0
13	8,400	14.0	1,400	182,720	32,100	150,620	18,500	6,500	24,000	32,616	3.88	23.30	21.7	136.0
14*	36,252	48.0	4,040	564,027	115,019	449,008	64,700	11,800	76,500	149,825	4.13	37.00	33.3	196.0
15*	22,962	30.0	2,500	435,026	38,848	396,078	34,100	7,368	41,468	136,922	5.96	54.80	34.6	330.5
16	6,280	18.0	1,029	90,179	33,367	56,812	14,700	6,400	20,100	26,710	4.25	26.00	47.0	126.5
17*	12,120	27.4	1,018	523,500	29,640	493,860	55,500	4,960	60,460	52,008	4.32	51.00	10.5	86.0
18*	62,000	99.8	9,040	2,437,000	198,750	1,882,250	147,800	44,340	192,140	324,000	5.29	35.80	16.3	168.0
19*	83,700	130.0	11,000	1,736,392	137,001	1,599,391	185,048	45,299	230,347	187,976	2.25	17.10	11.8	80.5
20*	34,350	93.8	9,163	1,321,100	156,573	1,164,540	150,000	Maximum value... Minimum value...	12,000 162,000	180,105 .....	5.25 8.04	19.60 79.10	15.5 47.0	330.5 60.5
Total*	380,105	628.75	51,598	9,875,975	1,021,666	6,794,242	908,848	205,067	1,113,915	1,465,956	42.99	349.70	215.2	1,698.0
Average*	34,555	57.15	4,690	897,816	92,879	617,659	82,622	18,643	101,265	133,265	3.86	31.79	19.6	154.4

demonstrates the physical plant is worth what it may have cost or what it may now appraise for. An investor will always be willing to pay a bonus for an established business as compared with buying the structural property without such business, because in the latter case it will cost something additional to create an established business. The total price the investor will be willing to pay for the structural property, plus the established business, is only such as will afford him a satisfactory return, present or prospective; consequently, the value to him may or may not be greater than the original investment or the appraised value, depending upon the revenue obtainable and the cost of operation, but in any case some part of the total value is represented by going value.

The comparative plant method has been criticised because the results "rest upon certain basic assumptions as to the rate of construction of the physical plant, the rate of recovery of the earnings, and the rate of increase of operating expenses."<sup>1</sup> There is no question but what the method rests upon "certain basic assumptions," the result of expert opinion, but where assumptions are based on reliable expert opinion, the courts have held the conclusions reached are a safe basis upon which to fix values. The assumptions made as to the rate of construction of the physical plant are the same as those used in ascertaining the cost of reproduction of the physical property, which is not generally criticised, at least as to principle. The rate of recovery of earnings can be fairly definitely established for any particular property by a study of local, historical conditions and a knowledge of the experience of similar plants. The rate of increase of operating expenses can be very definitely determined when the rate of recovery of earnings is fixed and from a knowledge of the output and analysis of the existing operating expenses.

At first thought it would seem as if the comparative plant method was used to "argue in a circle," in that present revenues, based on existing rates, are employed in order to determine the going value of part of the principle upon which fair return is to be allowed. To a limited extent this criticism is fair, but it will be easily recognized that if the existing rates are assumed to be excessive by some arbitrary amount, say 10 per cent. or 20 per cent., the total revenue of the existing plant can be reduced by the amount of the arbitrary percentage assumed and going value

<sup>1</sup> City of Greenbay vs. Greenbay Water Company, 11 W. R. C. R. 245.

figured on that basis. Such procedure will ordinarily show that the amount of going value determined by the use of the existing rates is but little in excess of the going value as found by arbitrarily reducing the revenues a moderate amount. In fact, going value will be found to exist in a very substantial amount, with the ordinary property, even though, as an extreme assumption, revenues are assumed and taken to be only such an amount as will provide for operating expenses including taxes and depreciation and a fair return on the value of the physical property. It must, of course, be recognized that the comparative plant method is to be used fairly and logically in assisting the judgment to determine a reasonable amount for going value; the method cannot be applied without sense or reason, merely as a mathematical performance, in working out to the last decimal point a figure which, beyond controversy, can be held as an absolute measure of going value.

Criticism of the comparative plant method has been made on the grounds that with the physical property entirely complete, the business of the customers and revenue of the utility would immediately be attached and developed. As a practical matter such is not the case. To any one unacquainted with the details of utility business, the rate of development is surprisingly slow and the lethargy and antipathy of the non-user is incomprehensible although, of course, much depends upon the character of the local community. It is difficult for the uninitiated to conceive of a city without a public water supply, for example, where the addition of consumers and the development of the business would not be practically as rapid as the progress of construction of the physical property. But such is by no means the case even with a utility providing such a necessity as water, and in the case of utilities furnishing transportation, gas or electric energy, the development of the business is very much less rapid than in the case of water. A most excellent illustration of this truth is shown by the history of the installation and development of the city water-works system in New Orleans, La. This city now has a population of 360,000, but in 1908 it had no public water-works system of its own and only an inadequate, privately owned plant, in the hands of a receiver. The construction of the city's waterworks was begun in 1905 and sufficiently completed three years later to begin furnishing water, the supply of water being taken from the Mississippi River. Up to that

time the citizens were depending largely upon tanks in which rain water was stored or in some comparatively few instances upon wells. The city has constructed a complete modern water-works system at an expense of approximately \$9,000,000, including pump works, equipment for sedimentation, coagulation and filtration, a distribution system containing 547 miles of pipes covering the populated districts, and the property is now in a position to supply all demands with a first class quality of water. In spite of the construction of the new municipal works and the availability of a copious supply of potable, pure water the citizens did not connect their premises and in order to compel the citizens to take water from the municipal system promptly, an ordinance was adopted by the authorities on July 13, 1911, under which the Water Board was given authority to notify individual householders that they must connect with the water-works system within 90 days of the said notice, and in case of failure to comply with said notice the property owner was subject "to a fine not exceeding \$25, or to imprisonment not exceeding thirty (30) days, or both, at the discretion of the Court, for each day thereafter." In case of continued default, upon further written notice requiring compliance within 10 days additional, then the Board was given power "to do, or cause to be done, upon the defaulting premises, that which its ordinances and regulations require, at the cost and expense of the owner, and such cost and expense shall be a lien on said premises equal in rank to the lien of the taxes, to take effect as to third persons on the recording in the Mortgage Office of the bill therefore, \* \* \*." This general line of procedure has been duly followed since, with the result that, in round numbers, 67,000 buildings have been connected out of the total 75,000 buildings now estimated in the City of New Orleans. In connection with this matter, a statement from the report of the General Superintendent, Mr. Earle, submitted to the Board Oct. 14, 1915, is of interest:

*"Forced Connections.*—Continued progress has been made in serving of notices on property holders to connect with the sewerage and water-works systems. To date a total of 7,556 notices have been served, of which 6,038 have been complied with, and 168 on which the 90 days limit of time has not yet expired."

The unwillingness of the citizens to take pure water exists despite the local conditions, namely:

*First.*—The large number of buildings supplied only from

tanks or cisterns with rain water of uncertain purity and variable in amount.

*Second.*—The desirability of doing away with tanks and cisterns, which very largely contributed to the continuation of the annual plague of yellow fever which formerly prevailed in New Orleans.

*Third.*—The attractiveness and healthfulness of a municipal supply of first class water at reasonably low rates.

*Fourth.*—The local strong sentiment favoring the use of water supplied by the municipality and demanding coöperation and support of a great public work.

*Fifth.*—The active enforcement of the ordinances and regulations providing for the connection of each and every house in the City with the municipal water supply.

The surprising tardiness and natural reluctance of the average citizen to change his existing mode of living, is completely evidenced in the record shown by the curves on the following page, indicating the slow progress made in substituting a pure and copious supply of water for the old sources of supply. The growth of the business, shown by the accompanying curves, reproduced from a diagram in the annual report of the Sewerage and Water Board of New Orleans, for the year ending Jan. 1, 1915, extended to 1916 by the writer, from data secured from the Department, indicates the growth of the business by the number of services and meters each year, from the time the water-works began supplying water in July, 1908, up to the present time. It will be noted that the number of services in use has increased at a very uniform rate and that the completed construction of the physical plant and its ability to supply water to all users, has not had very much to do with the rate at which the consumers are willing to take up with a new proposition and use, even so necessary a commodity as water.

The total house connections, including fire services, up to Jan. 1, 1916 were 41,037, that is, one connection for 8.8 inhabitants compared, for example, with 8.2, found by the Wisconsin Commission, as an average for Wisconsin towns. By reason of the difference in conditions existing before and after the city water-works was built, and because of the existing ordinance requiring the taking of city water, it would seem as if a water-works system in New Orleans, if anywhere, would show a very rapid increase in the number of consumers and yet the contrary is the fact.

The reluctance of the average citizen to become the user of public utility service is almost inexplicable, and has been the cause of frequent and calamitous loss to investors in public utility corporations. The following table, giving the actual results obtained in certain water-works properties is pertinent.

TABLE VII.—SHOWING THE TIME REQUIRED FOR WATER-WORKS PLANTS TO ACQUIRE ONE DOLLAR PER CAPITA OF DOMESTIC REVENUE

Prepared by the late Mr. Benesette Williams. (From Proceedings of the American Water-works Association, 1909, page 250.)

	Domestic revenue in dollars and population	Years to acquire one dollar per capita
Appleton, Wis.....	16,700	21
Eau Claire, Wis.....	18,000	15
Sheboygan, Wis.....	20,000	6
Galena, Kansas.....	4,700	8
Hornelsville, N. Y.....	11,000	8
Flint, Michigan.....	10,200	8
Dubuque, Iowa.....	36,300	29
Beloit, Wis.....	9,000	12
Ludington, Michigan.....	8,000	10
Warren, Ohio.....	7,200	7.5
Salina, Kansas.....	5,500	12

Unwarranted presumptions sometimes made by public utility commissioners or judges of court that the "comparative plant" method of estimating going value is "guess work," "mere opinion," "unreliable estimates," etc., are in many cases entirely unwarranted and indicate a lack of appreciation of the complicated facts, data and experience necessarily included in making up such estimates which are in most cases based upon a knowledge of conditions in similar or like plants, modified by the judgment of the expert in its application to the existing conditions.

The comparative plant method has been criticized because it takes into account the business of the existing plant in the immediate future. But such criticism would seem unfair because the estimate of the business in the immediate future is based on the facts as to the immediate past. Moreover, it would be illogical to determine present going value upon the assumption that the value should have been anticipated by a period of years. For example, if a city is purchasing property as of Jan. 1, 1916, and going value is figured as of that date, it would be illogical to assume that the city might have begun building the comparative

property five or six years earlier, before any decision was made to own such property, and accept such value as proper present going value. The question is whether the property was to be taken as of Jan. 1, 1916, and if so, what the city could afford to pay on that date, not what they could afford to pay if they had decided several years previously to purchase that property. Moreover, the dating back of going value would not very materially reduce the amount of same, as it would be effected only by the increase of future revenue over the present, which increase is usually a relatively small percentage of the existing revenue.

A modification of the deficit and comparative plant methods has been used by the Railroad Commission of Wisconsin, and was first published in the decision in the Milwaukee Gas Light Company case. The method consists, in general, in using such value of the physical property to start with as is estimated to be required to begin furnishing service and, from year to year, adding to such property value, additions, allowance for fair return, operating expenses and the necessary amount for depreciation, then deducting from the sum the annual revenue, thereby getting a value which is called plant value that represents the total cost of plant and business at the end of each year. If from this cost of plant and business, as found for any year, there is deducted the value of the physical plant and its additions at the end of such year, the result is the cost of development of the business up to the end of that year.

TABLE VIII.—COST OF DEVELOPMENT OF BUSINESS<sup>1</sup>  
Milwaukee Gas Light Company.

	1st year	2nd year	3rd year	4th year
Cost of plant, January 1st.....	\$9,000,000	\$10,005,220	\$10,498,385	\$10,688,922
Additions.....	500,000	300,000	250,000	100,000
Interest at 7 per cent.....	630,000	700,365	723,887	748,225
Interest on additions for ¼ year..	17,500	10,500	8,750	3,600
Operating expenses.....	660,000	989,000	1,131,000	1,265,400
Depreciation.....	160,000	170,000	180,000	190,000
Total cost.....	\$10,967,500	\$12,175,085	\$12,803,022	\$12,996,047
Revenues.....	962,280	1,676,700	2,114,100	2,414,250
Plant value, Dec. 31.....	\$10,005,220	\$10,498,385	\$10,688,922	\$10,581,797
Cost of developing business end of year.....	505,220	698,385	638,922	431,797
Assumed sales, cu. ft.....	1,320,000,000	2,300,000,000	2,900,000,000	3,330,000,000

<sup>1</sup> City of Milwaukee vs. Milwaukee Gas Light Co., 12 W. R. C. R. 462.

As seen by reference to the accompanying table, the plant value as found at the end of the first year is carried forward as the value of the property at the beginning of the second year, to which amount the value of additions to structural property, fair interest charges, operating expenses, necessary allowance for depreciation are added and from the sum is deducted the estimated annual revenue for the second year, thus getting the total cost of plant and business at the end of the second year; deducting from this sum the total cost of plant and its additions up to the end of that year, the remainder will be the cost of development up to the end of the year. The property cost at the end of the second year is then carried forward and forms the base to which are added the additions and charges for the third year, with deduction for gross revenue. This process is continued for several years, usually from four to six years, covering a period in which it is estimated the business can be built up to a point at which, under normal conditions, revenues are sufficient to provide a fair return upon the property, as well as depreciation and operating expenses. From the property value, as found for the last year, is deducted the total value of plant and additions, the remainder being the cost of developing the business at the time the property is assumed to be upon a paying basis, and therefore the said cost of development represents the going value which must be added to the value of the plant in order to obtain the total value of the property, since interest during construction is included in the value of the physical property, and all operating expenses, including taxes and depreciation, together with a fair return on the entire investment are cared for in the computation made along the above lines. Criticism of this method, the same as of the strict comparative-plant method, may be made on the grounds that actual revenue in place of "fair revenue" is used in the calculations. It has been suggested that the criticism can be avoided by substituting  $x$  for the final "fair revenue" and a fraction or percentage of  $x$  for the different preceding years, then solving for  $x$ , which when found and capitalized at the "fair rate of return" assumed will give the actual fair value of the entire property, including going value.

It will be seen the above method of estimating going value which has been used and apparently approved by the Wisconsin Commission is, like the comparative plant method, based on the value of the plant, assumptions as to the time required for its



construction, interest charges, taxes, estimates as to growth and development of the business and revenue extending over future period of time considered necessary to put the property on a basis where it will earn all operating expenses, depreciation allowances and a fair return.

In addition to the Wisconsin Commission, the Railroad Commission of California has approved the use of the comparative plant method in the following language:

"The engineers for the defendant have estimated a 'going concern cost' or 'development expense' for this system amounting to \$212,100. The computation by which this is derived assumes building an identical plant and is derived by the following method, as set out in the engineers' report:

'The sum of the annual excess in net returns of the existing plant over the comparative plant, in the period of years from the taking to the time when the earnings of the comparative plant are assumed to become identical with those of the existing plant, represents the development expense of the existing plant.'

"If applied to a fair period and based on accurate data, this method becomes an approximate measure of the amount of losses sustained in bringing the plant to a paying basis."<sup>1</sup>

The Supreme Court of Wisconsin has recently rendered a peculiar decision in which it took the position that the value of the property of the Oshkosh Water-works Company as found by the Wisconsin Commission at \$525,000 was correct, on the ground that:

"One thing is evident. The Commission either allowed \$54,000 for reproduction cost of paving not disturbed, and about \$14,000 for going value in their final award, or else they disregarded the item of \$54,000, and allowed \$68,000 for going value.

"An elimination of the item \$54,000 results, as before stated, in an allowance of about \$68,000 for going value. Under the evidence such sum is reasonably adequate. If the Commission erred in allowing only \$14,000 for going value, such error was cured by its allowance of \$54,000 for reproduction cost of paving not disturbed. If it did not allow the \$54,000 item, then it allowed \$68,000 for going value. In either case the plaintiff was not prejudiced."<sup>2</sup>

<sup>1</sup> Report of decisions of the Railroad Commission of California, Thomas Monahan, as Mayor of the City of San Jose vs. San Jose Water Company, Case No. 476, decided May 22, 1914 (Decision No. 1534, pages 14 and 15).

<sup>2</sup> Oshkosh Water-works Co. vs. Railroad Commission of Wisconsin, 152 N. W. 859, R. U. R. 1915, D 342, 4.

**Going Value not Plant Operation.**—The term “going value” is sometimes used in ignorance or disingenuously to indicate that the physical plant is working and going in the sense that the physical elements are performing the functions for which they were installed. This latter adaptation of the term “going” to the physical plant is entirely misleading and, as is evident, no additional value above the cost of complete construction, accrues to the structural property, *per se*, simply because the machinery is in motion and the plant used instead of being allowed to remain inactive. Considering a new property the cost of the physical plant complete before operation began would be identical with the fair present value of the same plant the following day when it was put into full operation if going value means nothing more than operation.

Some authorities have used going concern as distinct and separate from going value, apparently indicating by going concern, the fact that the plant is in operation and therefore going concern would mean the same as going value under the erroneous definition of the preceding paragraph. Going concern and going value are usually intended to cover the same item of property value, namely, that intangible element, not being represented by physical property, which results in addition to, but in connection with the structural property when the latter is being used so as to yield a revenue.

Going value as meaning nothing more than the operation of the physical property has been definitely and specifically urged by public authorities and is disapproved by courts. A very recent case of this kind is that of the Kings County Lighting Company, where the Public Service Commission of New York, First District, speaking through its chief counsel says:

“Aside from earning power, however, one may not doubt that in a rate case the business or the plant in which the several parts have been gathered together, in one place, connected and put in operation, may have value. It is assumed, of course, that the operation is not merely experimental and that the business or the plant has been gathered not in a wilderness but in some place where there is demand for its service. If this be not the fact, then the business or the plant is not worth even its construction cost and may possibly have no value whatsoever. Giving the plant any value implies necessarily that it is working and going to some extent.”<sup>1</sup>

<sup>1</sup> Brief of Hon. Geo. S. Coleman, Counsel of the Public Service Commission, of the First District, before the Court of Appeals, in the State of New York, page 27.

The eminent counsel in this case apparently fails to appreciate the difference between "the business" and "the plant." Evidently he would not allow any value to a physical plant which had been newly completed ready for business but had never turned a wheel because he says, "Giving the plant any value implies necessarily that it is working and going to some extent." This attitude of mind of counsel, supports the opinion of the Commission in the same case, as shown by the following statement:

"Throughout the appraisal the plant has been treated as a 'going concern.' The property has not been valued as a defunct or static concern. If it had been, the value would be very much lower than the amount fixed."<sup>1</sup>

It would be interesting to know what difference in value this or any other commission would make, between the value of a newly completed "static" plant, and that same plant "going." It will be noted that "going concern" is used in connection with the physical property whereas the term properly relates to the business and the establishment of revenue which is entirely distinct from the construction of a structural plant.

The Public Service Commission of the State of Missouri, in a recent decision, has fallen into the same error, stating:

"The Commission will not attempt to fix a separate and distinct item for going value in this case, as contended for by defendants, but will take 'into account, the fact that the plant was in successful operation' as a going concern."<sup>2</sup>

The attitude of certain public authorities in declining to allow a separate item for going value is, no doubt, in part due to the loose use of the term "going value" and "going concern value" by the courts, the contrary opinions and decisions of judges and courts themselves, due to failure to understand all the elements that go to make up utility property.

Going value is just as definite and essential a part of the cost of establishing the revenue, as is engineering, lawyers' fees, interest on investment, taxes, etc., a part of the cost of establishing physical property of a public utility.

<sup>1</sup> P. S. C. R. of New York, First District, Vol. II, page 694.

<sup>2</sup> Decision of Public Service Commission of the State of Missouri, rendered June 23, 1914, *McGregor-Noe Hardware Company et al. vs. Springfield Gas & Electric Co. etc.*, Reports Vol. I, page 526.

Both the Supreme Court and the Higher Court of Appeals, of the State of New York, have definitely negatived the claim of the Public Service Commission of New York, First District, and its counsel, that:

"going concern value as a separate item in the valuation of a property in the rate case was not to be ascertained, allowed and added to the value of the structural property."<sup>1</sup>

Judge Clark, quoting with approval the Supreme Court's decision in the Omaha Water Company, the National Water-works Company, Knoxville Water-works Company, and the Cedar Rapids Gas Company cases, and others, held that the New York Commission's decision showed on its face it had not properly allowed for going value in determining fair value, simply because the physical property was being used rather than allowed to stand idle. The Commission's basis of considering going value does not add one dollar to the cost of the physical property, completed and ready for service, whereas it is common knowledge that it costs additional time, effort and money to obtain business and produce a revenue. This fact is clearly recognized by Judge Miller of the Court of Appeals, which court sustains Judge Clark's decision, and passing on the method followed by the Commission says:

"The Commission in this case says it was taken into account in valuing the plant as a 'going' and not a 'defunct' or 'static' concern and that it was also considered in fixing the fair rate of return. The Appellate Division says that there is no proof of the latter fact in the record. Thus the first question certified required us to decide whether 'going value' is to be appraised as a distinct item, or whether it is sufficient to regard it as something vague and indefinable to be given some consideration but not enough to be estimated. The valuation of the physical property was determined by ascertaining the cost of reproduction less accrued depreciation. Preliminary and development expense prior to operation were included, but no allowance was made for the cost of developing the business. By that method, the plant was valued in a sense as a 'going concern,' in other words, 'scrap' values were not taken; but to say that that sufficiently allows for 'going value' is the same as to say that 'going value' is not to be taken into account."

\* \* \* "It would have been entitled to a return on the valuation adopted by the Commission if it had no customers, but was just

<sup>1</sup> Brief of Hon. Geo. S. Coleman, Counsel of the Public Service Commission of the First District, before the Court of Appeals in the State of New York, page 27.

ready to begin business, whereas it had a plant in operation with an established business, which every one knows takes time, labor and money to build up." \* \* \*

"Manifestly a rate computed on the cost to-day, reproducing the fair plant would not be fair. Experience is proverbially expensive." \* \* \*

"The term 'going value' though not exactly defined, has been used quite generally to comprise the elements not included in the structural value of the property in its present condition. The term is not important. The point is that in some manner and under some property heading a due allowance must be made for the investment in those elements."<sup>1</sup>

**Going Value not Rate of Return.**—Some theorists argue that going value cost should be paid off out of earnings and not allowed as a part of the capital value of the property. Such procedure is desirable where practicable, as would be the logical carrying out of that theory to its fair conclusion, namely, that the cost of the physical plant should also be paid off out of earnings so that the entire utility property would have no outstanding value and rates could justly be fixed by being based only upon operating expenses, including management, taxes and depreciation. Such regulation will absolutely "safeguard the actual investment of the security holders and reduce the cost of production and the rate of charge."

The trouble with these theories is that while they may be ideal they are impracticable. This is well illustrated by the following arguments advanced in a recent paper.<sup>2</sup>

"The better way is to forego dividends until earnings are adequate to cover ordinary operating expenses, cost of securing new business, and interest on bonds. \* \* \* Public policy with relation to public utility rates cannot be limited by an estimate of cost to a particular consumer at a particular moment. Public policy will look to the future as well as to the present and adopt the rate policy that offers the largest measure of public advantage even though the chief advantage be secured by future consumers rather than by those of the present. The rate-paying public can well afford to bear the temporary extra cost of amortizing all intangible and questionable elements of capital cost. This will tend to safeguard actual investment of the security holders and to reduce the cost of production and the rate of charge."

<sup>1</sup> Court of Appeals, State of New York, in *The People ex rel. Kings County Lighting Company vs. Wilcox et al.*, composing Public Service Commission, First District, Mar. 24, 1914, 210 N. Y. 479.

<sup>2</sup> "Principles of Valuation" by R. H. Whitten, *The Annals of American Academy of Political and Social Science*, May, 1914, page 194.

Under ordinary circumstances, investors cannot be induced to tie up their capital with the expectation that they shall be compelled to go without earnings in order to amortize any considerable part of the investment necessary for creating the property and "forego dividends until earnings are adequate to cover operating expenses, cost of securing new business and interest on bonds." The return upon capital is not and cannot be controlled by arbitrary rules. Free capital cannot be compelled to invest by statute. Unless regulating bodies recognize the economic laws which control the local rate of return demanded by investors, free capital cannot be induced to enter the particular enterprise under consideration. If investors are to be forced to go without their dividends in order to amortize some part of the proper capital cost of the enterprise, such enterprise will ordinarily not be financed. If rates are made sufficiently high in the early history of the average utility to provide in addition to operating expenses and dividends, an amount sufficient to amortize the cost of creating the business, then the rates will usually be so high as to reduce business to such a point as to jeopardize the success of the entire enterprise. The history and records of utility corporations show that it is utterly futile to expect that "the rate-paying public can well afford to bear the temporary extra cost of amortizing all intangible and questionable elements of capital cost." There is no reason why the future, as well as the present users should not pay a return on the capital properly expended in creating the business the same as they are expected to do on the capital invested in the establishment of the physical property. If regulating bodies desire to have the cost of establishing the business amortized, and will make the future rates sufficiently high to cover this amortization, as well as pay operating expenses and dividends the owners cannot object to such procedure, but because the owners have not amortized such costs in the past is no reason for arbitrarily reducing capital investment by such sum. If the capital necessary to expend in building up the business and revenue were customarily provided by the sale of securities, rather than by inclusion in operating expenses, probably regulating bodies would not fall into the error of concluding that the money sacrificed by the investor in the form of dividends does not belong to him, any more than they would if he had invested a like amount as original capital. It has been held by some few authorities, notably the Public Service Com-

mission, First District of New York, that "going value" has been included and allowed for, when instead of capitalizing early losses incurred in establishing a revenue there is allowed a "somewhat higher rate of return in later years." As will be recognized, this is a very crude way of approximating justice. A "somewhat higher rate in later years" is very indefinite and may, or may not, cover the early losses, the existence of which in connection with developing, or attaching the business to the physical property is generally undisputed. That this theory is wrong in principle is recognized by a large number of courts and commissions, notably the Wisconsin Commission, which has always ruled contrary to any such theory, and, as shown above, the Court of Appeals of the State of New York, affirming the rulings of the lower court, expressly disapproved any such theory of going value and recognized that going value should be included as a separate part of the capital investment. Such procedure permits a more equitable charge for service during the early days when revenue is likely to be small and charges for service relatively high.

"To view the matter in another aspect, take the case of a public service corporation with a plant constructed just ready to serve the public. It is going to take time and cost money to develop the highest efficiency of the plant and to establish the business. Three courses seem to be open with respect to rate-making, viz.: 1, to charge rates from the start sufficient to make a fair return to the investor and to pay the development expenses from earnings, a course likely to result in prohibitive rates except under rare and favorable circumstances; 2, to treat the development expenses as a loss to be recouped out of earnings, but to be spread over a number of years, in other words, as a debt to be amortized, that involves complications, but would seem to be fairer to the public and certainly more practical than the first; 3, to treat the development expenses, whether paid from earnings or not, as a part of the capital account for the purpose of fixing the charge to the public. The last course would seem to be fairest to both the public and the company, as well as the most practical."<sup>1</sup>

As is usual in the ordinary and normal course of business, if a utility property is not a paying one at the start, the investors are to that extent deprived of that to which they are equitably

<sup>1</sup> Court of Appeals, State of New York, in the people *ex rel.*, Kings County Lighting Company *vs.* Wilcox *et al.*, composing Public Service Commission, First District, Mar. 24, 1914, 210 N.Y. 479.

entitled, and, hence, are involuntarily compelled to reinvest the amount of such deficiency. To hold that investors are not entitled to interest upon this portion of their added, but more or less involuntary investment, is equivalent to saying that they may be deprived of a portion of their investment without due compensation.



## CHAPTER IX

### DEPRECIATION

**General Discussion.**—Any utility that has once gotten fairly started must include in its operating expenses certain items to cover the cost of renewing the exhausted physical parts. Where the cost of the individual parts renewed is a relatively insignificant part of the total operating expenses and where the life of these exhausted parts is relatively brief—for a few weeks, a few months or, at most, a year or two—the expenditures are included as a part of operating expenses under the head of “wear and tear” or “maintenance” without controversy. In the matter of such items there is seldom, if ever, any discussion or controversy with regard to ignoring their cost or value in ascertaining the present fair value of existing property, no deduction from cost new usually being made for “wear and tear.”

On the other hand, as to those elements of property that cost relatively large amounts, or last a number of years, there is wide divergence of opinion as to the proper method of handling the costs and providing for the expenditures necessary when renewing the elements, and equal difference of opinion as to whether or not the estimated, accruing amount of depreciation should be deducted from cost new in ascertaining present value. It will be seen that the reason for the difference in opinion as to this matter of accruing reduction in remaining usefulness of physical property depends primarily upon the arbitrary division of time adopted for convenient accounting. If public utilities, instead of making annual reports, were accustomed to make reports only once in 25 years, the so-called depreciation question would probably never have arisen, as affecting the basis of rate-making, because most or all charges on account of renewals and replacements (the life of so many physical elements having a life of less than 25 years) would then become merely maintenance and, like the other items of wear and tear, be taken care of in the gross operating expenses for the 25-year period.

"So we see the capital expenditures, as distinguished from expenses, are at last an arbitrary conception. It begins with the idea that certain expenditures have an efficiency which reaches over many earning periods extending indefinitely into the future. But nothing physical would last so long, and its earning power might even have less permanence. To meet this condition we arbitrarily designate certain expenditures whose affect indefinitely outlasts the immediate earning period as 'capital,' and then in the same arbitrary way, through all subsequent vicissitudes, we hold them to their first value by maintenance, renewal and depreciation charges, which are borne by other expenses."<sup>1</sup>

If this fundamental fact were generally appreciated, that the division of time in the life of utility property is divided into monthly and yearly periods for purposes of accounting convenience, it would be easily realized that charges for depreciation are merely provision for accruing maintenance. These expenditures must be deferred, because neither good business nor efficiency permit such expenditures for accruing wear and tear until such time in the future as renewals are required.

Considering a utility having many physical elements, which is neither extending nor contracting its property, in a town in which real estate values are at a standstill, the depreciated value of such property, neglecting scrap values, is approximately 50 per cent. of its cost new. The reason so many appraisals that take into account accruing depreciation result in a value as high as ordinarily found, from 75 per cent. to 85 per cent. of cost new, is due primarily to the fact that in America practically all utilities are constantly adding and enlarging their physical plant, so that the property, as a whole, is not in a normally depreciated condition. Where extensions and additions to original property are not being made, there will be found items of physical plant and equipment in all stages of life from new to that just ready to be discarded; consequently, every plant which consists of a large number of units and has been operated for sufficient length of time to have every element replaced one or more times, will be found approximately in a 50 per cent. theoretical depreciated condition, that is, on the average the property will be half worn out, although, if properly maintained, as useful as if new and rendering 100 per cent. service value. The statement of this general principle was first published by the writer in a paper on "Depreciation" read before the American Institute of Electrical

<sup>1</sup> Handbook of Railroad Expenses, J. S. Eaton, page 3.

Engineers in June, 1911. It has also been more fully explained by him elsewhere,<sup>1</sup> and elaborated by Mr. Jas. E. Allison and others.

Therefore, if accruing depreciation is taken into account in fixing the basis of rates, the present depreciated value of almost any large property, that is not expanding or contracting, and in which the value of real estate is but a small percentage of the whole, can be obtained by simply cutting the cost of reproduction new in half and adding 5 to 10 per cent. to cover scrap or salvage value.

Take, for example, a large steam railway system. It would probably be admitted without very much argument that the ties are in all conditions between the new ones that may have been installed yesterday and the worn out ones which are to be taken out to-morrow, so that, as their scrap value is zero, their present theoretical depreciated condition must be 50 per cent. of their total cost new. It would probably be admitted, without argument, that the same applies to the rails, spikes, probably also to each of the various classes of rolling stock, coal cars, freight cars and passenger cars, as well as locomotives, if the system considered is sufficiently large. The only exception to this general rule of ascertaining present theoretical depreciated condition is when the elements considered are few in number or relatively expensive. For example, a highway company operating a large bridge over a river could not apply the so-called Fifty Per Cent. Rule, because the system of averages does not control. In the same way, an electric light company could not apply the Fifty Per Cent. Rule generally to all its property, where there was but a single generating station containing few large units, although it might apply such method to ascertaining the theoretical depreciated value of its poles, insulators, wires, meters or transformers going to make up its distributing system.

In the preceding discussion, the term "depreciation" has been used more particularly in reference to exhaustion of physical property by reason of gradual wearing out. In case of inventions or sudden developments in the art that immediately render existing apparatus obsolete, or when by reason of exceedingly rapid growth of business installed equipment becomes inadequate, relatively large amounts of property may be almost instantly depreciated, and in such cases the average depreciated condition

<sup>1</sup> "The Valuation of Public Utility Properties," by Henry Floy.

of the property, as a whole, might be well under 50 per cent. On the other hand, the average general condition might be appreciably above 50 per cent. in the case of utilities owning relatively large amounts of physical property that does not depreciate or depreciates very slowly; for example, a water power property where a large percentage of the total investment is in real estate, dams, canals, or similar structures. From the foregoing it will be seen that there can be no question but that the market value of utility property parts, considered for purposes of sale without an inclusion of reserve or depreciation funds that may have been accumulated, is very much less than the cost new, even from the very instant installation is complete, and before the new property has been put into service. There can be no argument on this point, and it is freely admitted by all competent authorities in valuation matters that value for the purpose of sale and value for the purpose of rate-making are two entirely different matters. That value for rate-making is not market value may be illustrated by the fact that cast-iron pipe laid in the streets for water mains may cost a dollar per running foot when in place, but as soon as placed, that same pipe is not worth, aside from the purpose and use for which it was installed, more than a small fraction, perhaps 10 or 20 cts., of its original cost. It would hardly be argued, by the most ardent enthusiasts of market value as a basis of rate-making, that in the illustration used, new pipe, just installed, is only entitled to a return on its market value. It is generally recognized that many parts of every utility are incapable of being detached and sold separately, except on a basis of scrap value. Thus it will be seen that theoretical depreciation, or market value, has little or nothing to do with the value upon which rates should be based. The purpose of a depreciation account is to insure the continued and serviceable life of the physical plant as a whole; it is for the purpose of providing against possible depreciation of the owner's investment.

To fix rates upon depreciated value deters the making of improvements, except for exhaustion of physical property. The replacing of existing property before it is worn out, on the grounds of obsolescence or inadequacy, would accord only scrap value to the discarded property, thereby losing to the owners the difference in value between scrap and the unaccrued depreciated value. On the other hand, if cost new is taken as a basis of re-

turn allowed, the owner, being permitted to replace a depreciated by a new unit without affecting his capital account (where the cost of the old and the new unit is the same), will gladly and promptly take advantage of any improvements in the art or demands for greater capacity, in order to keep his plant thoroughly up to date. The use of depreciated values for rate-making discourages invention or the substitution of improved or new property for the existing plant. This is too frequently illustrated by the endeavor of public utility corporations to keep what is really superseded property or plant on its books and in use as reserve equipment, in order that its value may be included in the appraisals that are, or have been, made by public regulating bodies.

**"Absolute" and "Theoretical" Depreciation.**—Before undertaking to discuss proper methods of estimating and allowing for depreciation, it is essential to have clearly in mind just how depreciation actually takes place and in what way it effects physical property.

Where property is no longer of service, it must be depreciated down to the value at which it may be sold, even though that value is as low as scrap value. On the other hand, apparatus that is in use and rendering a service economically, may for the purpose for which it was intended, be as valuable as when originally installed, although its age may be approaching the limit of its life. Take for example a steam engine which though having been in use for the greater part of its estimated life is, through proper maintenance, in as good condition to render service as at any time in its history. If its annual maintenance charge is no greater than in the earlier years of its history, its "service value" to the company as a going piece of property is as great as when first installed.

What then do we mean by depreciation? Reference to Fig. 1 indicates graphically several ways in which depreciation actually takes place, as well as usual methods heretofore adopted in considering and evaluating depreciation.

Assume that a given piece of physical property has an estimated life of twenty years, represented by the abscissa  $OB$ , and that it has a given value in dollars, shown by the length of the ordinate  $OA$ . Let the ordinate  $OC$  represent the worth in dollars of the apparatus as scrap or junk, then the abscissa  $CD$  will represent the scrap value throughout the life. This line

is usually approximately a straight line, deviating therefrom simply by fluctuations in the value of scrap material, which is usually within fairly narrow limits. The point *D* is the value of the apparatus in question at the end of its life. It may reach this value through any one of several methods of depreciation, shown graphically by the curves No. 1, 2, 3, 4, 5 and 6.

Curves 1, 2 and 6 may be said generally to represent "absolute depreciation;" and curves 3, 4, 5 "theoretical depreciation."

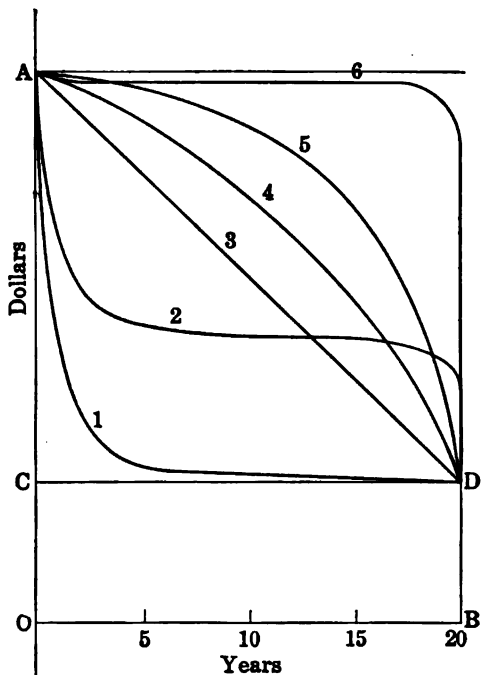


FIG. 1.

Considering "absolute depreciation," curves 1 and 2 represent the values, during any period of their lives, of most pieces of physical property, determined from the standpoint of bargain and sale for use elsewhere. The salable value of new apparatus depreciates very rapidly from the moment installed and then gradually during the remainder of its life down to "scrap value." The values thus illustrated are independent of the service for the particular installation for which the apparatus has been purchased and installed. Curve 1 may fairly represent the worth of certain pieces of property such as:

(a) Special machinery, the value of which, for use in connection other than that for which it has been installed, would necessitate such a large expenditure for modification of design to make it useful elsewhere that little more than scrap value can be obtained from same.

(b) Property the cost of removing which, compared to its cost new, is relatively high; for example, ties for track, or wooden poles of a transmission line.

Curve 2 represents sales value for more easily transported property, as for example the rolling stock or synchronous converters of a street railway system or transformers and meters of a lighting company.

The classes of depreciation indicated by the curves 1 and 2 might properly be called salvage values and approximate scrap or junk values, the principal difference being the property is sold for what it is worth as a unit rather than for its dismembered elements. It will be evident at once that depreciation of these classes cannot fairly be used in determining the value, on the basis of barter and sale in the general market, of the physical property of an operating entity. That this is true and the view taken by the courts will be evident from consideration of the decisions in the Consolidated Gas and other similar cases and even in the Knoxville Water case, which is generally considered the most radical decision in the way of depreciating physical value.

Curve 6 indicates depreciation due only to wear and tear until just before the close of life, at which time other classes of deterioration may appear. The curve is based on the assumption that the apparatus in question will be used for the purpose for which it was installed, throughout its life, and being maintained in good operating efficiency, 100 per cent., is just as good for the purpose of use as the day it was installed, aside from such slight deterioration as results from wear and tear. That is, the value of the apparatus or construction, being used for its original purpose, is equal to its cost, new or original, less the evaluation of the wear which has taken place; for example, a few tubes in a boiler might be so badly burned as to render the boiler unfit for service. The value of the boiler as a whole in its assumed condition is practically worth little more than scrap, but by the expenditure of a few dollars in renewing the burned-out tubes the value of the unit, say for the purpose of original installation

and use, is equal to the value of a new boiler. In any large system there is constantly a large number of parts always approaching the time of renewal. At any given instant of appraisal some such parts will be found completely worn out and the value of their replacement must be deducted from the cost new in order to obtain the real, actual and "absolute" depreciation at the instant of appraisal. But assuming the property as a whole is kept in first-class operating condition, that there is no inadequacy, obsolescence, or deferred maintenance and ignoring such slight deterioration as results from wear and tear at any given instant which may be apparent in detail parts in the system, the depreciation effecting the value of the plant for the purpose installed may be considered nil practically throughout its life, as an operating property. In a given unit just before the close of life other classes of depreciation than wear and tear may set in or deferred maintenance may be allowed to appear, in which case, of course, depreciation must be considered, but otherwise the value of the property for its original use is equal to the cost to reproduce new, and it is the real value of its physical property to a "going concern." This value or its equivalent is that generally allowed in "purchase and sale transactions," and has been recognized by public service commissions and legal authorities.

"If the present value exclusively were to be taken as the basis, respondent would not receive credit for having installed any part of its plant at full cost. The present value, as of June 30, 1908, must, therefore, be increased by the amount of the estimated depreciation on that part of the plant which the company installed new."<sup>1</sup>

"Of the physical plant alone, the most equitable valuation for rate-making purposes appears to be best represented by the original cost of the plant and by the cost of reproducing it."<sup>2</sup>

This "service value" would also seem to be recognized by the courts both in rate cases and in determining valuations for sale.<sup>3</sup>

"Probably a fair statement would be that the physical value of the plant is its value as a performing plant for the purposes for which it was designed."<sup>4</sup>

<sup>1</sup> *F. B. L. Fuller vs. Wausau Street Railroad Co.*, Railroad Commission of Wisconsin, April 1, 1910.

<sup>2</sup> *G. W. Hill et al. vs. Antigo Water Company*, Railroad Commission of Wisconsin, August 3, 1909.

<sup>3</sup> *City of Omaha vs. Omaha Water Co.* 118 U. S., 202. *Wilcox vs. Consolidated Gas Co.*, 212 U. S., 19.

<sup>4</sup> *Columbus Railway & Light Co. vs. City of Columbus*, Circuit Court U. S. Southern District of Ohio, report of Master, page 34.



If any contrary position were assumed, namely, that only "sales value," indicated under most favorable circumstances by curves 1 and 2, were to be used in determining present value, then a large portion of every going property would be practically valueless the day after construction and installation was completed, because the expense of removal would amount to more than the cost of new in the open market: for example, ties in a railway property; foundations and settings for machinery; pipe, deeply buried; cross-arms and many wooden poles.

Property—except real estate on road bed—cannot usually be maintained at 100 per cent. of its original value; ultimate economy seeks only 100 per cent. operating efficiency.

In contradistinction to determination of present value by the use of depreciation expressed in the curves 1, 2 and 6, which may be termed "absolute," the curves 3, 4 and 5 indicate several classes of "theoretical" depreciation which have been quite widely used in some cases for estimating present values, but more often for determining the yearly theoretical deterioration for purposes of establishing depreciation funds, which, however, is quite a different subject. Making a theoretical estimate of the probable, future, average, annually accruing deterioration of certain property to provide an item in book-keeping accounts of operating expense has nothing whatever to do, in making an appraisal, with fixing the definite amount of absolute, actual or accrued depreciation which depends upon the present condition of physical property, determinable from inspection and not upon historical documents, depreciation funds, or disputed theoretical conclusions. Nevertheless, the erroneous application of rates of depreciation in the attempt to determine present commercial values for purposes of capitalization is fairly common.

These three curves 3, 4 and 5 represent classes of depreciation which seldom, if ever, occur in practice but are convenient for purposes of estimate, particularly curve 3, which represents what is called "straight line depreciation." As indicated, it assumes a gradual and constant reduction in the value of property throughout its life. The significance is that if, from the cost of apparatus, the value to be obtained at the end of its life, namely, the scrap value, is deducted, the remainder divided by the assumed life, in years, of the apparatus, will give the amount in dollars to be laid aside annually to accumulate a fund sufficient to replace the property at the end of its life without interest.

Curve 4 is closely related to curve 3; the annual depreciation fund, however, being less because it is assumed that the uniform amount of money laid aside annually during the life of the property will be put out at interest and compounded so that owing to the accumulation of interest the amounts annually laid aside will be less than in the case of "straight depreciation." Curve 4 is called the "sinking fund" method.

Curve 5, a modification of curve 4, is based on the assumption that, instead of laying aside a regular amount annually and compounding, the amount laid aside will be small at first, gradually increasing in amount as the earning power of a property increases, as it generally does, with its life. These amounts are then assumed to be put out at compound interest so as to aggregate original cost of the apparatus at the end of its life. No general rule has been developed as to the proper amounts to begin laying aside or in what proportion they shall increase; but it is clear that the smaller are the amounts in the beginning the larger they must be toward the end of the life of the apparatus.

This latter plan of providing depreciation funds has the advantage of more nearly proportioning the annual depreciation payments in accordance with revenue, and for most pieces of property will more closely approximate the deterioration actually taking place.

A fourth plan of determining "theoretical" depreciation has been used to limited extent. It consists in assuming a given life for the property in question, ascertaining the annual rate of depreciation and then applying that rate uniformly to the principal diminished in amount each year by the deduction for deterioration. For example, if the principal invested were \$2000 and the rate assumed is 10 per cent., the amount charged off for depreciation the first year would be \$200, leaving the principal, \$1800, on which 10 per cent. or \$180 would be charged off the second year, and \$162 the third year, etc.; thus the amount charged off becomes progressively less and the life of the property becomes, theoretically at least, infinite. Of course this method can be modified from the "straight line" depreciation illustration used above to the "sinking fund" method, if desired.

From the preceding it will be seen that any one of these four methods of estimating depreciation is based on absolutely arbitrary assumptions. Practically there is no more logical reason *per se* why the fund—if necessary—to replace the property at

the end of its life should be provided in any one of the several methods suggested by the curves rather than in any other of the several methods. Each method will accomplish the same result, but it will be seen at a glance that in applying curves 3, 4 or 5, the amounts to be laid aside annually will vary considerably, and to that extent effect net income; similarly, the effect on the worth of the owner's investment will also vary with the curve used, being appreciably less for "straight line" depreciation.

**Accruing Depreciation not Allowed.**—Whatever weight there may be in the argument that theoretical depreciation should be deducted from cost new when properties are being considered which have originated under public service regulation, such arguments can have no weight with reference to such properties that were in existence before the present régime of public control was instituted. Not only were the owners of public utilities encouraged to consider that all revenue beyond that required to pay for ordinary operating expenses was net income and belonged to the owners, but the courts absolutely prohibited many public utility owners from laying aside annually out of revenue, and accumulating in funds, amounts considered necessary for providing against future accrued depreciation. With these decisions of the courts in mind, how unfair is it to insist that those utilities doing business long before the present form of public utility regulation began should have the value of their property determined and their rates fixed on the basis of deducting theoretical accruing depreciation from cost new, in order to ascertain so-called present value, at least in amounts larger than those determined by the accumulation in reserve funds established since public service regulation was instituted. Not only have the State courts in widely separated parts of the United States stated that no deduction should be made from net income to provide against accruing depreciation, before ascertaining the amount that might fairly be paid out as dividends, but the Supreme Court itself has ruled on this question and held that only expenditures actually made can be claimed as proper deductions from earnings.

In 1890 the authorities of the City of San Diego, Cal., passed an ordinance reducing and fixing the rates of the San Diego Water Company. The company brought an action in the Superior Court of California to annul the ordinance and enjoin its enforcement, on the grounds that the rates fixed were insufficient to provide revenue sufficient to cover expenses and a fair return

upon the value of the property. The Court found that the water plant had cost \$750,000 and "that the annual depreciation of the plant on account of natural decay and use amounted to  $3\frac{1}{4}$  per cent. of its value."

Thus it will be seen that in annual operating expenses the Court included an amount to cover theoretical accruing depreciation. This inclusion of an allowance for depreciation, the Superior Court found, reduced the net income to an amount insufficient to afford a fair return on the value of the property, and in consequence the Court declared the ordinance void. Upon appeal by the city to the Appellate Court of California from the decision of the lower Court, above referred to, the Appellate Court reversed the Superior Court, saying on page 574:

"With regard to the question of the depreciation of the plant by use, it is sufficient to say that ordinary repairs should be charged to current expenses, that substantial reconstruction or replacement should be charged to the construction account, and that depreciation should not otherwise be considered."

Two other judges who sat in the case wrote concurring opinions; that of Judge Garrouette, on page 582, says:

"This balance (after making deductions for operating expenses and interest) of \$25,000 is profit, unless it is swallowed up by the finding of the Court that the plaintiff's plant suffered an annual depreciation of  $3\frac{1}{4}$  per cent., and the conclusion of law therefrom that a percentage upon the investment to that amount should be added to the operating expenses before the point is reached where profit begins. We are satisfied that this finding has no support in the evidence, even conceding the conclusion of law drawn therefrom sound. In the first place, the evidence develops that there can be no general depreciation of this plant as a whole. There are tunnels, wells, reservoirs, water rights and real estate, amounting to more than one-half of the valuation of the plant, there is no depreciation on these things; there is no wear and tear, no permanent and gradual destruction by use and age. Most of them stand as everlasting as the hills.

"The theory of the plaintiff in this regard seems to be that the life of a plant of this character may be approximated at 30 years, and that a sinking fund of one-thirtieth its value should be collected from the rate payers annually and laid aside to be handed to the stockholders upon the sad occasion of its demise, as alleviating salve to their sorrow."

Another judge writes a concurring opinion, which, however, throws no particular additional light on the subject here being

discussed. Out of the six judges who passed on the matter, only one, Judge Beatty, wrote a dissenting and separate opinion which says, on page 588:

"As to current expenses, all operating expenses reasonably and properly incurred should be allowed, taxes should be allowed, and the cost of current repairs.

"In addition to this, if there is any part of the plant, such as main pipes, etc., which at the end of a term of years (20 years, for instance) will be so damaged and worn out to require restoration, an annual allowance should be made for a sinking fund sufficient to replace such part of the plant when it is worn out."<sup>1</sup>

From the preceding, it is clearly evident that the Court thoroughly understood the question upon which it was ruling, namely: whether or not an annual allowance to cover estimated accruing depreciation of physical property, which must ultimately be replaced, should or should not be included in operating expenses. Judge Beatty definitely held that such allowance should be included, but the majority of the Court overruled him and held that no such allowance should be granted the owners for the protection of their property.

In a later decision, the Appellate Court of California reaffirmed its position with regard to allowances for depreciation where the Redlands Water Company brought action to annul a city ordinance upon the ground that

"the rates therein prescribed would not yield a revenue sufficient to enable it to pay the interest on its indebtedness, its operating expenses and taxes, and for keeping its plant in repair and replacing the same."<sup>2</sup>

The matter having been passed on by the lower, so-called Superior Court, which had allowed \$2,898.60, to cover

"the annual depreciation of the plant, aside from the amount requisite for its maintenance and repairs during the year."<sup>2</sup>

the Appellate Court, referring to its previous discussion of the principles involved and its ruling in the preceding San Diego case, again reversed the Superior Court's ruling and refused to recognize the depreciation allowance or to annul the ordinance.

In view of the full discussion in the San Diego case, including the ruling of the Superior Court and the reversal of the holding

<sup>1</sup> San Diego Water Co. vs. City of San Diego, 118 Calif. 556.

<sup>2</sup> Redlands Lugonia & Crafton Domestic Water Co. vs. City of Redlands et al. 121 Cal. 312.

of this Court by the Appellate Court of California, and the re-affirmation of the principles involved in the Redlands case, it is interesting to compare the rulings of the Railroad Commission of California, which holds that the fair present value of utility property is found after deducting the amount of estimated, accruing depreciation, which the Appellate Court has previously ruled the owners of the property shall not be allowed to provide out of revenue. Comment is unnecessary.

In the case of a disagreement between stockholders of the Flint and Pierre Marquette Railroad Company, the Federal Court refused to include in operating expenses certain charges that had been made to cover accruing depreciation. The directors of the railroad had charged to operating expenses certain items of new construction, but as to certain steamboats operating on Lake Michigan, the Court says:

"In 1884 there was a charge against expenses for depreciation on these steamers amounting to \$6,000. In 1885, there was a like charge for depreciation, and also a charge of \$2,500, as depreciation of dining halls, the total charges making \$14,500. These sums were not actually expended out of earnings but were estimated and charged against operating expenses. This was not proper. No depreciation account was either kept or warranted by the charter, as between the two classes of stockholders, and no expenditures having actually been made to meet such depreciation, the estimated amount thereof could not properly be deducted from earnings or net income. The sum of \$6,000 should, therefore, be credited back to earnings for 1884, and \$8,500 for 1885."<sup>1</sup>

The Supreme Court itself concurred in, and confirmed, the holdings of the lower court by excluding from operating expenses charges for accruing and unexpended depreciation. In the case of the Federal Government vs. the Kansas Pacific Railway seeking to determine the net earnings of the railroad, the Supreme Court reversed the judgment of the Circuit Court, from which appeal had been taken, expressly holding with regard to "depreciation account or expenses not charged up" that:

"This is explained to be the amount necessary to put the road in proper repair, but which was not actually expended for that purpose. We are clearly of the opinion that it is not a fair charge. Only such expenditures as are actually made can, with any propriety, be claimed as a deduction from earnings."<sup>2</sup>

<sup>1</sup> *Macintosh et al. vs. Flint & Pierre Marq. R. R. et al.* 34 Fed. Rep. 609.

<sup>2</sup> *U. S. vs. Kansas Pac. Ry. Co.*, 99 U. S. 459. See also: *Tutt vs. Land.*, 50 Geo. 339, and *Emery vs. Wilson*, 79 N. Y. 78.

**Depreciation Estimates Inaccurate.**—There is no way of absolutely and accurately measuring the amount of accruing, theoretical depreciation existing in physical property at any given time. All estimates of theoretical depreciation are based on assumptions as to the probable life, which is fixed from a consideration of the law of variation of the periods of expiring usefulness of the different elements of property. It is only when a particular unit has been abandoned, or replaced, that fact replaces judgment and estimate, consequently, the accurate amount of accruing depreciation, which exists in any individual element at a given time, is indeterminate. Theoretical depreciation can be assumed to apply only to sufficiently large groups of units of the same type and character, so that the law of chances, or the average law of contingencies will apply. Consequently, the futility of attempting to determine the theoretical depreciation of a single unit, differing from all others as to size, or type, owned by the same utility, is at once apparent. The application of an average life, determined from the consideration of the shortest life, and the longest life with all intermediate lives of similar pieces of apparatus in various localities, and existing under widely different conditions of service, may or may not be applicable to the particular case being considered. Thus, it will be recognized that the attempt to fix the value of any particular piece of property, rendering a given service by the application of general law, based upon average results obtained under widely varying conditions, may do great injustice, either by giving too high a value to the particular element being considered—if it has been mistreated, and allowed to get out of repair—or too low a value, if through high degree of maintenance and little use, it is worth more than the average.

It is a fact, becoming to be generally recognized, that physical property does not deteriorate in accordance with the straight line method of estimating depreciation; it more nearly approximates the sinking fund method, but in most instances that method would have to be considerably modified to represent the true rate of depreciation. "The use of averages is misleading and cannot be expected to yield results in line with a careful study of the facts." Adaptability of the unit to the entire equipment, conditions of use, care in maintenance and climatic conditions, are all local factors, which mean variations from the average.

That neither the straight line, nor the sinking fund method,

nor estimating the condition at any given period, in even a large number of units, accurately discloses the real depreciated condition is shown by the following explanation and illustrations of actual depreciation rates given by Mr. Edwin Gruhl.

"As modified by the addition of a minimum service value, the depreciation rates upon a sinking fund and straight line basis may be graphically illustrated in Fig. 2. An average life has been assumed of 40 years. At 20 years, or half the average life, the present value will

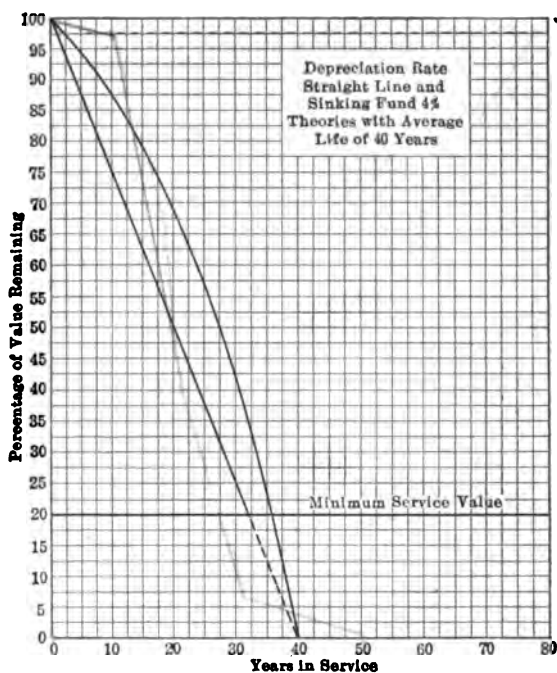


FIG. 2.

aggregate 50 per cent. upon a straight line basis and 68.7 per cent. upon a 4 per cent. sinking fund curve basis. Upon a 3 per cent. curve the percentage at the same age would have aggregated 64 per cent., and upon a 2 per cent. curve it would have aggregated 60 per cent.

"These curves may be viewed in two ways. They may be supposed to represent either the gradual deterioration in value of an average unit of equipment or the law of deterioration of a large number of units of any life. If we deal with the average, we suppose upon the straight line basis that 50 per cent. of its life and usefulness has passed away at say 20 years, or one-half the average life, but that if the average unit shall survive the average life or 40 years it will continue at a



minimum service percentage irrespective of the probability that its additional expected life or usefulness is small or large. If we deal with the group, however, we assume that at 20 years only 50 per cent. of the group is expected to survive, and that at the average age, the survivors will have an indefinite expectancy of life.

"The only method of testing these assumptions is to apply our actual experience to these assumed rules. When observations as to the timing of replacements from any cause are summarized in accordance with the

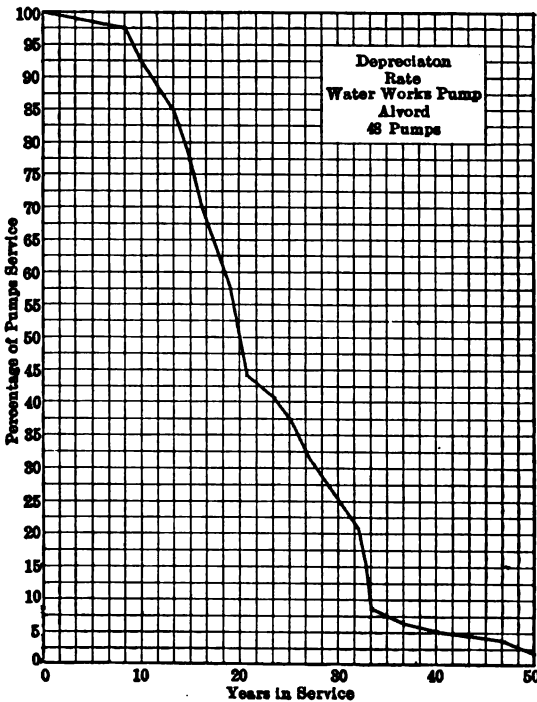


FIG. 3.

usual statistical methods, they indicate that neither the sinking fund curve nor the straight line represents the law of depreciation of the group in practice. Two illustrations of actual depreciation rates have been selected and are here graphically represented.

"Fig. 3 summarizes experience as to completed life in service of 48 water-works pumps secured by Mr. J. W. Alvord and published in the *Proceedings* of the American Water-Works Association. The majority of the pumps represented have been retired because inadequate, a few were discarded because obsolete, and the remainder scrapped.

"No attempt has been made in these illustrations to separate data as to replacements due to wear and tear as distinct from inadequacy,

obsolescence or other causes, but neither has this particularization been made in the usual application of the straight line and sinking fund theories. When experience data as to life of equipment in service are regularly recorded, refinements as to causes will probably be a later development.

"This method of charting observations is identical with that used by actuaries in determining the expectancy of life of human beings. Such experience is summarized in Fig. 4.

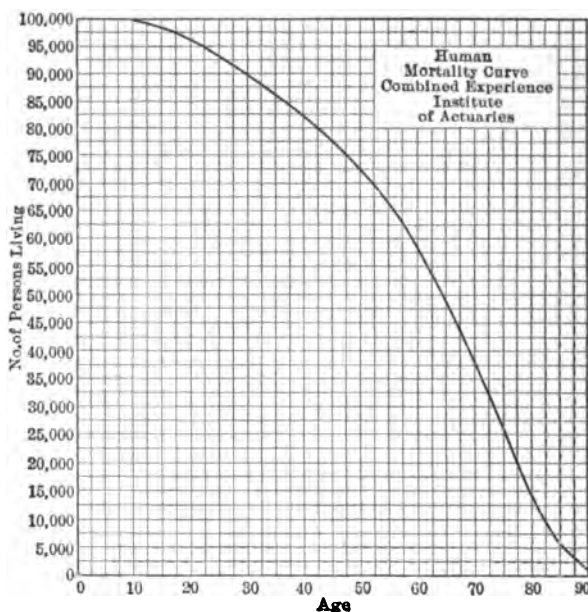


FIG. 4.

"This latter curve is designed to fit two causes; one, chance without previous disposition to death or deterioration, the other an increased inability to withstand destruction. Life statistics of utility equipment where the element of chance such as obsolescence or inadequacy is small and the gradual deterioration the main cause of depreciation may be expected to group themselves as the life data summarized in Fig. 4.

"Generally, any life data, the average of which exceeds the middle life value will result in a mortality curve the upper or concave portion of which will be more extended than the lower or convex portion of the curve.

"The obvious advantages of the mortality curve method of determining present value over the straight line or sinking fund methods are:

"(a) Every point is determined by experience and where a large number of instances of replacement have been utilized to determine the character of the curve, additional data will make only slight modi-

fication. It is impossible therefore to generalize with insufficient data.

"(b) It is not dependent upon an arithmetic average and is applicable to any age whether or not the average life has been exceeded.

"(c) It measures the effect of all causes of depreciation affecting the property and the effect of those causes at any age upon the average unit.

"(d) When sufficient reliable data are available, it will permit by actuarial methods, the calculation of the annual reserves, which, with or without interest accumulations, as the case may be, will insure the replacement of the various elements of property at the end of their probable lifetimes. That there is a substantial difference between the annual reserve required for a new property and that required for one badly depreciated, readily follows.

"(e) It draws the line sharply between what is the rate of depreciation, the appraisal problem, and the means of financing depreciation, the reserve problem.

"Instances where actual data as to life in service are available, indicate that both the straight line and sinking fund curve assume greater depreciation rates in the early years of life than obtain in the experience indicated by a mortality curve, and hence result in lower present values.

"Let us assume for example that the mortality of a unit of equipment with an average age of 20 years follows the observation as to life in service of incandescent lamps. A comparison of straight line, sinking fund curve and mortality curve will then result as follows:

TABLE IX.—REMAINDER LIFE OR CONDITION PER CENT. UNIT WITH  
AVERAGE LIFE 20 YEARS

At end of	Straight line, per cent.	Four per cent. sinking fund curve, per cent.	Mortality curve, per cent.
2 years.....	90	93.2	99.4
4 years.....	80	85.7	97.5
6 years.....	70	77.9	94.5
8 years.....	60	69.1	90.5
10 years.....	50	59.7	85.3
12 years.....	40	49.6	79.4
14 years.....	30	38.7	72.7
16 years.....	20	26.7	65.4
18 years.....	<sup>1</sup> 10	14.0	57.8
20 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	50.0
24 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	34.6
28 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	20.6
32 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	9.5
36 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	2.5
40 years.....	<sup>1</sup> 10	<sup>1</sup> 10.0	0.0

<sup>1</sup> Minimum service value.

"In any valuation proceeding where present values play an important part, the necessity of securing actual and sufficient data as to variation of life in service is evident. Theories which are generalized from insufficient experience are equitable neither to the public utility, the investor nor the community."<sup>1</sup>

Of course, it will be recognized from what has been said and from the curves shown by Mr. Gruhl that the preceding statements of the author to the effect that, in considering any given property, average figures and curves, compiled from a large number of instances, must be used with care and judgment, even when applied to similar articles existing in large quantity; furthermore, that such averages cannot fairly be applied when considering but two or three units of a given type. Consequently, theoretical depreciation, in determining so-called present depreciated value, cannot be used either from the standpoint of fairness, or from what it is practicable for any accountant or engineer to accomplish. This being the case, the fixing of values and basing of rates by the use of such methods is demonstrably unscientific and illegal.

Any such basis of ascertaining present depreciated value, as a basis of rate-making, is "fanciful," "speculative" and unsupported by "reasonable judgment" or sufficient definiteness to permit its acceptance by the Supreme Court. This will be evidenced, for example, by a comparison of the values shown in the three columns quoted above from Mr. Gruhl's article. Taking the period at 10 years of expired life, it will be seen that under the straight line method, the item is only in 50 per cent. condition; under the 4 per cent. sinking fund method, the value is almost 10 per cent. higher, or practically in 60 per cent. condition, whereas under the mortality curve, it is in 85 per cent. condition. There are arguments why any one of these three different values should be assumed. Yet the investor, if the mortality curve depreciation is taken, will be allowed 70 per cent. larger rate of return than if a straight line assumption were made. Could anything be more absurd and unfair to the investor! Yet, the same property and the same investor, if located in New York, under the ruling of the Public Service Commission, of the First District, using the straight line method would at the end of 10 years have only 50 per cent. of the investment allowed as a basis of fixing the rate of return; whereas, if the property were in

<sup>1</sup> "Depreciation Estimates," by Edwin Gruhl, A. E. R. A., March, 1913.

Wisconsin, the Railroad Commission of that State, using a 4 per cent. sinking fund curve, would fix rates on 60 per cent. of the cost new value. The use of such artificial and arbitrary methods of estimating "present value" is seen, for example, in the change of chief engineers by the Wisconsin Commission. Under a former engineer's direction, 80 per cent. was taken as a minimum depreciated value of electric switchboards, and their equipment; whereas, under a recent ruling of the present engineering force 30 per cent. is now used as a minimum value, so that simply by reason of a change in the personnel of the organization, the investor now has his rate of return reduced over one-half, although the same switchboard and equipment may be in use, and only a year or two older. Is further argument necessary to show that such widely varying bases of estimate of value, depending upon personal judgment and experience, which varies widely, as between different individuals, cannot be used in varying the value of the property used in serving the public?

The difference of opinion among engineers as to the fair and proper annual allowance to be made to cover depreciation, and the necessity for different allowances due to the different conditions under which the physical property exists, is shown by the following table, which indicates what is actually being done by various railroad properties:

TABLE X.—SHOWING VARIOUS ANNUAL RATES USED FOR DEPRECIATION OF ROLLING STOCK EQUIPMENT, YEAR ENDING JUNE 30, 1915<sup>1</sup>

Road No.

- 1—An arbitrary charge of \$1,200 per year.
- 2—4 per cent. of original cost less estimated value of salvage.
- 3—6 cts. per car-mile for maintenance and depreciation.
- 4—3 per cent. of the original value.
- 5—5 per cent. of the valuation of equipment.
- 6—An arbitrary charge of \$3,600 per year.
- 7—3 per cent. of record book value.
- 8—One twenty-fifth of 75 per cent. of original cost. (Twenty-five year life; 25 per cent. salvage.)
- 9—Arbitrary deduction from income; \$500,000 per year for several years.
- 10—1 per cent. of appraised value.
- 11—2 per cent. of value.
- 12—3 per cent. of cost of equipment.
- 13—1 per cent. of gross value.
- 14—An arbitrary charge of \$2,400 per year.

<sup>1</sup>"Depreciation and Appreciation," by W. H. Forse, Jr.; *Electric Railway Journal*, Dec. 11, 1915, page 1169.

- 15—One twenty-fifth of 75 per cent. of original cost.
- 16—5 per cent. of value.
- 17—2 per cent. of estimated value.
- 18—4 per cent. of estimated cost less 25 per cent. salvage.
- 19—2½ per cent. of present value.
- 20—Arbitrary charge of \$12,000 per year.
- 21—2 per cent. of book value.
- 22—2½ per cent. of inventory value.
- 23—An arbitrary charge of \$1,000 per year.
- 24—5 per cent. of appraised value.
- 25—6 per cent. of gross income.
- 26—6 per cent. of gross earnings for maintenance and depreciation.
- 27—Arbitrary charge of 4.3 per cent. of investment.
- 28—5 per cent. of appraised value less estimated salvage.
- 29—10 per cent. of value.
- 30—5 per cent. of estimated value.
- 31—2 per cent. of book cost including betterments.

It may be noted that the allowances made represent an expectation of life ranging from 10 to 100 years, showing the necessity for consideration of local conditions by experienced and intelligent engineers before conclusions can be reached as to depreciation data.

What engineer is able to foretell the misuse and neglect or care and high degree of maintenance that any given apparatus or utility property as a whole will receive, even during the next 5 or 10 years, with vicissitudes of climate, load conditions, changes of management and requirements of the public? Estimates as to the future life of utility physical property must necessarily be too tentative, speculative and inexact to permit fixing definite and positive values thereon.

The various tables published and ordinarily used by engineers, as representing the lives of physical property, are based upon figures and experience that include expiration of life due to both age and functional depreciation. As a matter of fact, the natural life of much physical property is unknown. The limit of the natural life of so widely used property as cast-iron pipe, for example, cannot be stated positively and authoritatively, for in the Gardens of Versailles, France, such pipe has been in use considerably over 200 years and is still in excellent condition. Furthermore, the expiration of life due to functional depreciation is little more than a guess, based on necessarily limited past experience, generally involving both natural and functional depreciation. Consequently, value to be determined by estimates

of depreciation, which involve knowledge that is based on necessarily too meager data, or prophecies that are merely human guesses, cannot fairly be used.

"It is clear from the foregoing that the manner in which the subject has been treated in the past is always an element of great importance in reaching the conclusion in a rate case when a portion of the life of the property has expired. If the company has consistently proceeded upon the sinking fund theory, it would be inequitable to change suddenly to the straight line method of depreciation, and *vice versa*. \* \* \*

"These mathematical computations need not be continued, their sole purpose in this place being to present in clear form the fact that it is impossible in a rate case equitably to adjust the matter of depreciation without considering how it has been handled by the company in the past. If it has been handled in the past upon the straight line method, a change to the sinking fund theory would obviously be unjust to the public and give greater returns to the company than it is entitled to, because an essential element of the sinking fund theory is that the company gets no benefit from the sinking fund until the end of the term, and therefore the return upon capital must be continued upon the full amount of the investment until the term of life of the property has expired."<sup>1</sup>

Perhaps the most notorious reversal of public utility commission valuation is that recently made by the Public Service Commission of Washington in a decision issued Oct. 19, 1914, denying the application of the Seattle, Renton & Southern Railway Company for an increase of rates. In its opinion the Commission says:

"With reference to the valuation of right-of-way and terminals, a rule of appraisal has been followed by this Commission from its inception, and by the company's engineer in this case, with which the Commission, as now constituted, cannot agree. A multiple has been used as a result of which the fair average value of the right-of-way has been doubled, and, in some cases, trebled."

This change of front, namely, the refusal to use a multiple in land values, resulted in a reduction of the present depreciated value of the property from \$1,601,315 to \$959,955, or nearly 40 per cent., due almost entirely to the different methods used by the present Commission. Continuing further, the Commission says:

<sup>1</sup> Public Service Commission, State of New York, Second District, Louis P. Fuhrman vs. The Cataract Power & Conduit Company, decided Apr. 2, 1913, P. S. C. R. 2d Dist., Vol. III, page 720.

"Shippers and passengers are now paying interest upon millions of dollars that have no existence outside of the imagination or arbitrary notion of a so-called expert." \* \* \* "We further hold that the company had no right to include 'engineering, legal expenses,' etc., 'interest during construction,' 'discount and commissions' based on this hold-up value of the right-of-way lands."

It seems too bad that newly appointed commissioners, evidently without experience to qualify them for rate-making, should be unwilling to rely on the judgment of experts—presumably qualified—and state that "there is no logical reason, nor does justice demand that the patrons of a public utility pay interest upon conjectural expenditures that were probably never made," simply because they find that "under such a system this Commission can never lower the rate once established." Commissions are not appointed for the purpose only of lowering rates without regard to justice.

It is, of course, argued that such imperfect and incomplete knowledge as we have must be used in the estimates of the life of physical property which are made the basis of allowances for depreciation and the accruing of depreciation funds. While this is acknowledged, it must be admitted there is no practical objection to making an allowance to cover depreciation in the future, based on our best judgment of to-day, which allowance it is possible and fair to modify in the future by the amount that experience demonstrates those particular allowances to have been in error. This application of estimating depreciation can be made without injustice to the public, or the utility, as allowances provided by the latter may be kept intact and devoted to their proper purpose, so that the public will ultimately receive the benefit in the future on any excess allowances made in the present.

There can be no question whatever that in order to conserve the full value of an investment in a wasting asset, such as physical property, the amount of the annual theoretical depreciation should be estimated and provided for out of revenue each year, during the assumed life of the physical property. These annual payments laid aside and reserved for the purpose of meeting the necessary expenditure at some date in the future for replacement, in no way affects the absolute value of the property rendering service to the public, or the value upon which rates are fixed or return to the investor determined.



In fact, the utilities themselves as a whole are only beginning to appreciate and provide for all of those items of expense and future depreciation which were not apparent in the early history of corporation service. Even where these elements have been appreciated, the exigencies of maintaining dividends and sustaining and improving the quality of the service have sometimes necessitated the deference of these charges.

**Depreciated Basis. Unfair Return.**—Commissioner Thelen of California, although preferring investment cost, rather than reproduction cost, very clearly shows the fallacy of using reproduction cost reduced by theoretical depreciation as the proper basis for determining rates:

“While I thus find myself unable to agree with defendant’s argument with reference to the estimated reproduction cost new theory, I find that there is much merit in defendant’s attack upon the basis resulting from the subtraction from the estimate of reproduction new of theoretical depreciation based upon mortality tables. Engineers frequently ascertain what they call a ‘per cent. value’ by subtracting from the estimated reproduction cost new, an item for theoretical depreciation, which is ascertained by multiplying the average age of each class of material by the theoretical depreciation obtained from so-called mortality tables. The basis so secured may be just as unfair to the utility as the basis of reproduction value new may be to the consumer. Thus a public utility plant may originally have cost \$10,000. The money may have been invested honestly and with a fair degree of wisdom. At the end of three years the plant may be giving 100 per cent. service. The component parts have been correlated and the system is in first-class working order. While the component parts may not be intrinsically as sound as when they were new, it would be a foolish waste of money to renew them, for the reason that they are doing their work and that they are giving 100 per cent. service, without any danger of wearing out in the near future. Under these circumstances, an engineer applying mortality tables and estimating the theoretical depreciation at 5 per cent. per year, reaches the conclusion that the present value of the plant is only 85 per cent. of the original investment, being the sum of \$8,500. The Commission is accordingly urged to grant a return based on an estimated present value of \$8,500. If this return is allowed at the rate of 8 per cent., an allowance of \$680 will be made for interest. The utility, however, has in good faith paid out of its pocket for capital account the sum of \$10,000, and is giving 100 per cent. service to the public. What is to become of the remaining \$1,500 which the company has honestly invested? If a man loans \$10,000 on a first mortgage, he expects interest on the entire sum which he loans and expects ultimately

to get back his entire principal. Why should this same man, if he invests \$10,000 in a public utility enterprise and keeps up his property in first-class condition, so that he is rendering 100 per cent. service, be refused a return on the difference between his investment and a theoretical depreciated reproduction value? It may be urged that justice may be done by placing the remaining \$1,500 in a depreciation fund, which fund may be invested and bear interest. As I shall hereafter show, however, under the provisions of section 49 of the Public Utilities Act, the income from investment of moneys in depreciation funds of public utilities in this State must be carried in these funds and cannot be used for the payment of interest on investment or operating expenses. The injustice of applying such theory becomes more apparent as the age of materials and structures increases. If the theory is carried to its logical conclusion and the engineer makes no allowance for repairs and replacements, but confines himself strictly to the age of the structures and his mortality tables, there will come a time when the value of the property will have been depreciated to zero, so that no return whatsoever would be allowed. While this may be a fanciful case, it is of value in testing the accuracy of the theory. It seems strange that public utilities, in protesting against this theory, frequently do not seem to realize that the real reason for their protest is that the application of this theory deprives them of a return of a portion of the money which they have invested. It must also be remembered that the ascertainment of the physical condition per cent. of a property is one thing and that the ascertainment of a proper basis on which to give a return may be an entirely different thing. The engineer frequently forgets this distinction, and erroneously believes that his work is the same as that of the rate-fixing authority."<sup>1</sup>

The value of the investment, or the worth of the property in the service of the public does not change because a part of the capital may be changed. For example: cash working capital is provided as a part of the investment.

It ordinarily consists of cash, materials and supplies. The normal and proper amount of working capital—when once determined for a given corporation at a given time—is left unchanged as a part of the value on which rates are fixed and return allowed, regardless of the ratio between the cash and the physical property making up the total working capital.

No one would think of deducting the deterioration in the coal-pile from the cash working capital, and yet the total value of the fuel depreciates as fast as it is shoveled into the fire. Because

<sup>1</sup> Decision of the Railroad Commission of California, *Town of Antioch vs. Pacific Gas and Electric Company*, Case No. 400; Decision No. 1655, July 6, 1914.

the value of property, having a life extending over a period of years; depreciates very slowly is no reason why that depreciation should be treated in any different way than short-life property—such as fuel—which is exhausted and renewed every few days. Everyone recognizes that there is no necessity for varying rates with the fuel account, which daily fluctuates in value, the deterioration of which is charged to operating expenses as fast as it is consumed.

Why should similar temporary extinguishment of capital by the partial transformation of investment in the wasting away of physical plant be deducted from the worth of the property used for fixing rates?

It has sometimes been argued that because for purposes of sale, the present value of a property is determined by deducting the sum of both absolute and theoretical depreciation from the original cost, or reproduction new, that therefore such present depreciated value should be used as a basis of rate-making. The illogic of such a proposition will be evidenced from the consideration of value in connection with a piece of real estate. In the case of purchase or sale of real estate, carrying a mortgage, the purchaser pays in cash the difference between the full value of the property and the mortgage, assuming the obligation for the mortgage, but because the new owner has paid only this difference in cash, which may amount to but one-third, or one-half, of the total value, no one would argue that the rent of the property should be based on anything but the sum of the mortgage and the cash payment—that is, the full value of the property. In the same way, the purchaser of a utility in buying an operating property, which does not carry with it a cash fund, or its equivalent, equal in an amount to the estimated depreciation, pays only for the present value obtained by deducting the sum of absolute and theoretical depreciation from the full value. But in such purchase, the new owner assumes the obligation to make good, when due, the amount of all depreciation, which is equivalent to a mortgage of that amount on the utility. Therefore, the new owner is entitled to earnings and allowances for depreciation on an amount equal to the sum of his cash payment, that is, the depreciated present value plus the depreciation evidenced and accruing on the property.

Using the depreciated present value as a basis of rates, the older, more decrepit and dilapidated a plant is, the lower the rate

to the public, so that a modern newly installed plant would be unable to obtain competing business.

If a depreciated value is used, as a basis of return, instead of the investor's being able to earn a fair return, say 8 per cent. during the life of the property, he will be able to earn only an average of 4.7 per cent., as shown in the following table, where there is assumed an original investment of \$100,000 in property, having a life of 20 years, depreciated on the sinking fund basis compounded at 4 per cent. annually.

If 3.358 per cent. of \$100,000 = \$3,358 is annually laid aside and compounded at 4 per cent., this amount will, at the end of 20 years = \$100,000.

TABLE XI<sup>1</sup>

Age (years)	Constant K.	Constant K. $\times$ 0.03358 per cent.	Depreciated value	8 per cent. on depreciated value
1	1.00	3.36	\$96,640	\$8,000
2	2.04	6.85	93,150	7,730
3	3.12	10.47	89,530	7,460
4	4.25	14.25	85,750	7,170
5	5.42	18.25	81,750	6,860
6	6.63	22.40	77,600	6,530
7	7.90	26.70	73,300	6,220
8	9.21	31.15	68,850	5,870
9	10.58	35.5	64,500	5,510
10	12.01	40.4	59,600	5,160
11	13.49	45.3	54,700	4,770
12	15.03	50.5	49,500	4,370
13	16.63	55.8	44,200	3,960
14	18.29	61.4	38,600	3,540
15	20.02	67.3	32,700	3,090
16	21.82	73.2	26,800	2,615
17	23.70	79.6	20,400	2,140
18	25.65	86.1	13,900	1,630
19	27.67	93.0	7,000	1,110
20	29.78	100.00	.....	560
				<hr/> \$94,290

It should be recognized in any case, that it is much more important to the future growth and welfare of a utility that there be established a reasonably liberal valuation upon its property than that it be given what might be considered an excessive rate of return. Moreover a utility must have certain earnings

<sup>1</sup> Average per cent. on investment = 4.7145 per cent.

to enable it to raise additional capital and if a commission fails to allow full property values, it is confronted by the practical necessity of granting a rate of return which may be considerably in excess of that which public sentiment would approve.

Contrary to a rather prevalent popular notion and against the opinion and desires of many, the courts and commissions are not uniformly fixing rates of return upon the reproduction cost new of the physical property reduced by theoretical depreciation. An examination of many decisions rendered shows that the value finally accepted for rate regulation is an amount as large as the actual cost or investment or reproduction cost new.

The Massachusetts Public Service Commission has repeatedly taken investment without deduction for depreciation as the basis of value for rate-making, and one very recent decision along this line was handed down the first of last August in the case of the Blue Hill Street Railway Company operating in the suburbs of Boston. The Commission's decision in this case, followed the precedent established in 1914 in the Middlesex & Boston Company's case. The Blue Hill Company had been unable, on account of small earnings, to accumulate reserves to offset depreciation, the total deficiency for maintenance and depreciation since 1905, the Commission found to amount to \$35,341. With respect to accrued depreciation, the Commission says:

"The extent to which deduction should be made for accrued depreciation must, to some degree at least, be determined by the method employed in ascertaining the gross amount from which such deduction is to be made. Because a method of dealing with depreciation may be sound where such gross amount represents the cost of reproduction new, it by no means follows that the same rule can be rigidly applied where the gross amount represents honest and prudent investment. Under the reproduction cost theory, credit is given to the company for appreciation on items entering into the estimate of cost (and often for 'going concern value'), and it is entirely consistent with that theory to make a deduction to the extent of existing depreciation on other items. On the other hand, if a fair return is to be measured by the 'capital honestly and prudently invested,' and if no credit is allowed for appreciation of the property through an increase in land values or higher unit costs of material and labor, it would hardly seem just to deduct the full amount of the accrued depreciation under all the circumstances and without reference to the causes of the failure of the company to make due provision for it.

"The ruling of the commission in the Middlesex & Boston case was accompanied by the express stipulation 'that if there is mismanagement causing loss, such loss must be charged against the stockholders legally responsible for the mismanagement.' In other words, the company is held to the same standard of honesty and prudence in the management and maintenance as in the original acquisition of its properties. It must, so far at least as it reasonably can, keep its investment good. If through some fault of its own it has failed to make due provision for depreciation, it cannot reasonably expect the public to pay a return upon that portion of the investment which it has neglected to preserve. But under a consistent application of the investment theory it would seem in general that deduction should be made for the depreciation which comes of age and use in so far only as the failure to make provision for it is due to the payment of unwarranted dividends or is otherwise attributable to mismanagement.

"In this case the stockholders have received no dividends whatever. In view of the low earnings, the character of the territory in which the company operates and its past and present efforts to increase its revenues, and after careful consideration of its history, the commission is of the opinion that the failure to make provision for depreciation and the virtual loss of invested capital caused thereby cannot justly be ascribed to mismanagement. To sum the matter up, the property has depreciated in value in the public service, and the stockholders have had no dividends. On the other hand, the public served has been receiving transportation at less than real cost, and has, in effect, used up a portion of the property without giving an equivalent in return. As stated in the Middlesex & Boston case, to hold under these circumstances that the accrued depreciation should be deducted would amount to saying that money lost during the earlier stages of a public service enterprise is irretrievably lost by the stockholders; that if perchance rates have been fixed so low that the rate-payer has for a period of years obtained a service at less than cost this is the permanent misfortune of the stockholders, and that the public should never at any time and under any circumstances be called upon to make up a deficit thus incurred."

In conclusion the Board held that the Blue Line Company was entitled to revenues sufficient to make an amount equal to a fair return upon all the capital honestly and permanently invested in the property, without any deduction for accruing or accrued depreciation. That is, the company was entitled to a return on \$21,237 of capital funds previously used for reconstruction, as well as the sum of \$13,750 representing discount on bonds finding a total value of the property of at least \$500,000 upon which

the public was not paying the company a fair return, and, therefore, the Commission authorized an increase in rates.

It is encouraging to see the later decisions of commissions and courts taking the correct view of the treatment of depreciation in determining the value of property upon which rates are based. The Supreme Court of Idaho rendered an opinion last summer of more than usual interest because of the clear, definite statements made, as follows:

"So far as the question of depreciation is concerned, we think deduction should be made only for actual, tangible depreciation, and not for theoretical depreciation, sometimes called 'accrued depreciation.' In other words, if it be demonstrated that the plant is in good operating condition, and giving as good service as a new plant, then the question of depreciation may be entirely disregarded."<sup>1</sup>

The superficial reader of the Supreme Court's decisions, notably those in the Knoxville and Minnesota rate cases, says: "The Court rules that depreciated value must be taken as the value for rate-making." The Court does so rule; no one can take any exception to that, but the Court further explains that to obtain "depreciated value" or "present value," it is necessary "when an estimate of value is made on the basis of reproduction new, the extent of existing depreciation should be shown and deducted." If on these instructions the expert proceeds to ignore the rule that "existing" deterioration should be deducted, and proceeds to estimate the amount of both "existing," obtained from inspection, and "theoretical, accruing depreciation," as determined from computations, then taking the sum of these two items he deducts said sum from reproduction cost new, he has not followed the instructions of the Court, but on the contrary done something for which the Court decision gives him no warrant.

Theoretical depreciation measures the decrease in amount of investment in perishable property, being the estimated proportion of the time that has expired since investment was made to the total number of years of estimated serviceability. Absolute depreciation depends upon the existing character of the physical property, the effect of the natural elements upon it and the care with which it has been used and the amounts expended upon it for maintenance and repair. Thus, it will be seen that there is

<sup>1</sup> *Murray vs. Public Utilities Commission*, 150 Pacific Reporter 50.

no necessary or probable reciprocal relation between the deterioration of investment value and depreciation of physical property.

"Where the depreciation is deducted from the assumed cost of reproduction new of the property, the cost of reproduction new is taken to be the amount of the original investment, and then the assumed depreciation is deducted therefrom in order to get at what is termed the actual value of the property. The question is whether this is just or unjust to the company.

"Continuing the use of the figures, hereinbefore taken as the basis of the illustration, we may assume that the property being investigated is a machine which costs \$20,000, and it has been in use 10 years, and the rate is being established the eleventh year. The assumed term of life of the machine is 20 years, and therefore the depreciation is 50 per cent., and the value of the property in the public service is taken to be only \$10,000.

"Assume that the case presented is No. 5 above stated, namely, the business for the 10 years the property has been in service has only yielded the interest return of 6 per cent. and nothing whatever for the destruction of capital. This is a common situation. The first 10 years it may be assumed have been employed in building up the business and getting it to a point where it would pay proper returns upon the investment. It has in fact yielded only \$1,200 a year, when it ought to have yielded, in order to fully reimburse the owners, \$1,800 a year. Now, if at the end of 10 years the rate-making power decides that the value of the property in the public use is only \$10,000, and makes a return upon that both for use of capital and destruction of capital, the company from that time on for this particular machine gets \$600 a year for use of capital and about \$335 for destruction of capital. The clear result is that the company by this method of treatment has absolutely lost \$10,000 of its original investment without any hope of return of the same to it."<sup>1</sup>

"The depreciation of a plant, though it may not be so apparent, is just as real and substantial a charge against revenues as the wages paid to operators or any other employee of the company. For the public to refuse to pay, through addition to the rates, a sufficient allowance to guarantee the company against seeing the plant, which it places at the disposal of the public, gradually fritter away and become lost, is unconscionable and inequitable. No just or fair-minded person any longer expects this."<sup>2</sup>

<sup>1</sup> Public Service Commission, State of New York, Second District, Louis P. Fuhrmann vs. The Cataract Power & Conduit Company, decided Apr. 2, 1913, P.S.C.R., 2d Dist., Vol. III, page 721.

<sup>2</sup> Sixth Annual Report of the Nebraska State Railway Commission to the Governor.



**Knoxville Case.**—The master's report in the Knoxville case<sup>1</sup> shows that in obtaining the value of the property on which he estimated the rate of return, he used higher unit prices than the average; he included over \$22,000 worth of service connections, which had been donated by the water consumers; also \$2,000 as a "contingent allowance for bad bottom," and he did not make any deduction for wear and tear, deferred maintenance, inadequacy or obsolescence, adding the sum of both "complete and incomplete depreciation" to the estimated depreciated value of the surviving plant in order to obtain the value which he used as the basis of rates. The Supreme Court very properly criticized such procedure saying that it would obviously "lead to incorrect results if the cost of reproduction is not diminished by the deterioration which has come from age and use" and while the Court did not attempt to decide how much of the master's value of the tangible property should have been diminished by the depreciation which the property had undergone, it did state it would be improper that "the amounts of complete and incomplete depreciation should be added to the present value of the surviving parts" in order to obtain the total plant to be used as a basis of rate-making.

Is it not clear that in this case the Supreme Court consistent with its decision in the Consolidated Gas case was pointing out that such deterioration as that resulting from "age" and "use," that is wear and tear, causing exhaustion of property, also deferred maintenance, inadequacy, obsolescence, age—in the sense that the life had completely expired—must be estimated and deducted from replacement cost in determining fair present value? If not, and the Knoxville Water case properly construed means that present value is to be obtained by deducting the theoretical depreciation from cost, how is it made consistent with the decision in the gas case?

The term "complete" depreciation in this case refers to that deterioration which represents "that part of the plant which through destruction, or obsolescence, had actually perished as useful property. The incomplete depreciation represented the impairment in value of the parts of the plant which remained in existence and were continued in use." The master's report in the Knoxville case indicates that "complete" depreciation can be determined by "a detailed examination of the property as it

<sup>1</sup> *City of Knoxville vs. Knoxville Company*, 212 U. S. 1.

stands to-day;" it must therefore cover that deterioration due to inadequacy, obsolescence, deferred maintenance or property worn out by "age and use" and not actually employed in the service being rendered. It is these various classes of depreciation just specified, and not theoretical calculations based on office records as to date of installation and assumptions as to expectations of life that are referred to by the Court, in the Knoxville and other cases, where the specific statement has been made to that effect that depreciation must be deducted in determining the value of property to be used in fixing rates.

That the Knoxville decision means all depreciation, both observed or "complete," as well as calculated or "incomplete," must be deducted from the cost new in order to determine present value, has been insisted upon by certain courts and decisions as the full and final conclusion of the whole matter, without reference to or proper consideration of the principles enunciated in the Consolidated Gas decision rendered the same day, and of subsequent decisions more adequately presented and better prepared. As is quite generally known, the Knoxville Water Company case was not adequately prepared, or well presented in comparison with our present-day knowledge of these matters, so that the resulting decision, with many of the dicta of the court, has been taken as too conclusive, based on misapprehension of facts and misinterpretation of the Court's meaning. With a more thorough understanding of the principles of valuation and rate-making, subsequent decisions of the Supreme Court may be expected to support conclusions in conflict with those so frequently read into the Knoxville case, rather than in confirmation of the rather common interpretation of the decision in that case.

The master's failure to make any deduction for deferred maintenance, inadequacy or obsolescence, adding the sum of both "complete and incomplete depreciation" to the estimated depreciated value of the surviving plant in order to obtain the value which he used as a basis of rates, corresponded to taking the depreciated value of the existing property and adding thereto the cost of all property which has been used in the past and which no longer existed, the value of which should have been repaid to the investors out of revenue as a part of operating expenses, during the life of the now superseded property.

Although the Supreme Court says the master erred in adding

the sum of "complete" and "incomplete" depreciation to the depreciated present value, it does not state that he would have erred in adding only "incomplete" depreciation to the depreciated value. While the language of the Court seems contradictory as to different parts of the decision and its intent is not clear and logical, the Court could not have considered that adding the amount of "incomplete" depreciation to the present depreciated value to obtain "*present value*" would have been an error, otherwise it could not logically have stated that renewals must be paid for out of revenue as part of operating expenses, for

"if a different course were pursued the only method of providing for the replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stock. This course would lead to a constantly increasing variancy between *present value* and bond and stock capitalization, a tendency which would inevitably lead to disaster to the stockholder or to the public, or both."<sup>1</sup>

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It is evidently the thought of the Supreme Court that present value and the amount of capitalization as represented by stocks and bonds, that is, the investment value, should correspond or tend to equal one another, which would not and could not be the case if "present value" were taken to mean present theoretical depreciated value. The Court says:

"The company is not bound to see its property gradually waste, without making provision out of earnings for this replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning."

Could any statement be more explicit as indicating that the original investment, if maintained by necessary maintenance and renewals, is entitled to be considered in determining the basis of fixing rates? How, then, could the Court hold in the same decision that the amount of "incomplete" or estimated, theoretical, not yet accrued depreciation should be deducted from reproduction cost new in order to ascertain the basis on which to fix rates? The two lines of argument are absolutely incompatible. Evidently, what the Court had in mind was that the investment value, which would be the same as the cost of reproduction new of a property just completed, should be reduced

<sup>1</sup> City of Knoxville vs. Knoxville Water Company, 212 U. S. 1.

only by the amount of complete depreciation, the value of which must be provided out of earnings.

The decision states that

"A sufficient amount should be allowed from the earnings of a public service corporation for making good depreciation of plant and replacing deteriorated portions thereof."

This is a mere statement of a widely recognized, and generally acknowledged principle in considering the distribution of revenue of a public utility, although the actual application is, in many instances, impossible, because of inadequate revenue and the impracticability of raising rates. The court then continues: "but amounts so expended cannot be considered as additional to the original cost in valuing the plant for purposes of ascertaining whether a rate is confiscatory." If these amounts that are to be allowed and expended in making good depreciation are not "to be considered as additional to the original cost," then may they be added to the present depreciated value in determining that value upon which rates are to be based? The answer is, of course, in the negative; for, if the sum of all allowances, provided and expended over a long period of years, were added to the present depreciated value of the property as found, the sum of these quantities would exceed the replacement cost new, or the "original cost." Consequently, the attempt to add the amounts allowed, or expended, for making good depreciation, cannot be used in any way in determining the value to be ascertained as a basis of fixing rates. For to attempt to use such amounts leads to *reductio ad absurdum*. The only logical conclusion then is that investment, original or reproduction new value, is the primary basis to be used in fixing rates. But this value or basis is to be reduced by the amount of "complete" or evidenced deterioration such as obsolescence, inadequacy, deferred maintenance and the like, the cost of which must be borne by the customer as a part of operating expense. Furthermore the owner must maintain his property, providing out of revenue derived from rates a sufficient sum to take care of ordinary operating expenses, wear and tear and, when earnings permit, the necessary replacements, as the plant becomes exhausted through "age and use."

"There is no controversy whatever over the proposition that the public must pay at some time and in some form for the property which

is destroyed or used in affording it the service which it receives, and there is no controversy over the fact that this return should be spread equitably over the entire life of the property. \* \* \* The public in whose service the machinery has been worn out must pay the company for the machinery."<sup>1</sup>

**Minnesota Rate Cases.**—Nor does the decision of the Supreme Court in the Minnesota rate cases decide that theoretical depreciation should be deducted from reproduction new to arrive at present value as a basis for rates. At page 457 the Court says:

"it is also to be noted that the depreciation in question is not that which has been overcome by repairs and replacements, but is the *actual existing depreciation* in the plant as compared with the new one. It would seem to be inevitable that in many parts of the plant there should be such depreciation, as, for example, in *old structures and equipment remaining on hand*. And, when an estimate of value is made on the basis of reproduction new, the extent of *existing* depreciation should be shown and deducted. \* \* \* And when particular physical items are estimated as worth so much new, *if in fact they be depreciated*, this amount should be found and allowed for."

If the above quotation means anything, it would indicate that the depreciation of the theoretical, estimated kind, which is normally "overcome by repairs and replacements" is not the kind of depreciation being considered by the Court, but only "actual existing depreciation." This is evidenced, for example, by deduction for the value of "old structures and equipment remaining on hand," after having served their useful life, and held, perhaps, for resale as scrap, or retained at full value in the books by the corporation hoping to be allowed to thus artificially increase the "fair value" of its property upon which the rate of return is to be allowed. In the case of reproduction new, "the extent of *existing* depreciation should be shown and deducted." This repeated use of "*existing* depreciation," and the word "actual," certainly indicate that class of depreciation which is in evidence, apparent to the inspector, capable of ascertainment by examination to prove that it is "actually existing" is what is being considered. The Court expressly further states that when "physical items are estimated as worth so much new" depreciation is to be deducted, "if in fact they be depreciated," and pre-

<sup>1</sup> *Fuhrmann vs. Cataract Power and Conduit Co.*, Public Service Commission of New York, Second District, No. 154, P. S. C. R., 2d Dist., Vol. III, page 716.

sumably not otherwise. In the very nature of physical property, it is impossible after it has once been installed that full 100 per cent. value can be represented by all the parts, except for the service intended. Utility property, generally, is maintained in a condition between 80 and 90 per cent., depending upon the particular kind of property, and cannot economically be maintained in a better condition, but this 80 per cent. condition which can be maintained year after year, indefinitely, cannot be had at all without expending the 100 per cent. of value. The Supreme Court states that depreciation must be deducted on the particular physical items being considered, "if in fact they be depreciated." It will be noted the Court expressly raises the question as to whether there has been depreciation, or not, by the statement "if in fact they be depreciated." Absolutely, in every case, if market value—regardless of value for service—was considered, there would be depreciation of physical property the instant it was installed and there could be no "if" in the case. The use of "if" by the Supreme Court clearly indicates that depreciation should be deducted from reproduction new, only in case deterioration has resulted in the service rendered by the physical elements. For example, the installation of foundations for a particular engine are almost worthless for any other engine and are entirely worthless for an engine in any other location and, yet, practically worthless as a marketable article, no one would deny that the investor is entitled to earn a return on the full 100 per cent. investment in said foundation.

If there is one thing that the decision of the Supreme Court in the Minnesota rate cases clearly establishes, it is that unwarranted assumptions, speculative bases and hypothetical conclusions will not be accepted for facts by this Court. This expression of opinion runs all the way through the decision and clearly indicates that the determination of value by artificial rules, formulæ and speculation, instead of by examination of conditions, ascertainment of facts and positive testimony thereon, will not have weight or carry conviction with the Court. Note, for example, the following quotations from the decision:

"The ascertainment of that value (fair value of the property) is not controlled by artificial rules. It is not a matter of formulæ. \* \* \* "

"The cost of reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper

degree of certainty, but it does not justify the acceptance of results, which depend upon mere conjecture."

" \* \* \* It is not admissible to attribute to the property owned by the carriers a speculative increment."

" \* \* \* It is an increment which cannot be referred to any criterion, but must rest on a mere expression of judgment which finds no proper test or standard in the transactions of the business world. \* \* \* "

"For an allowance of this character there is no warrant."

Could anything be more definite or explicit in condemnation of the use of "formulæ" instead of reasonable judgment for determining the fair present value of property?

The tacit acquiescence and final acceptance by public utility corporations of the decisions of rate-investigating commissions, fixing the rate of return upon the so-called present depreciated value of property being investigated, has resulted in an absolute confiscation of a part of the corporation's property.

**Public Utility Decisions.**—That "present value" as ordinarily used by the courts does not mean "present theoretically depreciated value" is substantiated and recognized by public service commission decisions. The St. Louis Commission in the Union Electric Light & Power Co. case found the cost of reproduction of the property on page 64 of their report to be \$16,976,025; there was deducted for depreciation \$841,632, that is, 4.7 per cent., in order to obtain the present depreciated value. The St. Louis Commission declared for the principle here contended for in the following clear language:

"In depreciating to arrive at the present value of the depreciable property, the Commission does not consider it fair to make deductions for anything but the present physical condition, and for items where it is plainly apparent that the property has become obsolete and inadequate. The usual estimate of the life of the different parts of a public service property, so far as they deal with obsolescence or inadequacy, are extremely problematical. These elements should not be generally taken into account in determining the present value."

Later, the same Commission rendered a decision in the matter of the United Railways Company, expressly stating that it did not depreciate the property in determining the basis for rates, thus following the precedent it set in the case of the Union Electric Light & Power Company.

Still more recently, Oct. 14, 1913, the same Commission, in its report on the Southwestern Telegraph & Telephone Co., reaffirms

its previous rulings on the question here being considered, and at page 21 adds:

"The aim of regulation should be protection of the consumer and just treatment of the investor. If the investors have placed a certain amount of money in an equipment in the service of the public and are maintaining and are obliged to maintain said equipment at the highest efficiency, and are renewing all worn or obsolete parts as soon as they become unfit for service, it would seem that they are performing their full duty to the public and should be allowed to earn returns on the amount invested in the public service for the equipment in the service of the public, unless it can be shown conclusively that the public have paid them back a part of their investment in the shape of clearly defined depreciation charges. Where there has been no regulation in the past and where it can be shown that there was no necessity of establishing a depreciation fund equal to the consumption of estimated life of each item of equipment (see Appendix D, page 122), deduction for theoretical depreciation in a rate case involving a large 'piecemeal' built property in a normal and efficient state becomes in fact merely a confiscation of past profits."

The Board of Public Utility Commissioners of New Jersey in the well-known decision in the Passaic case of the Public Service Gas Company, where the Board, commenting upon the two methods of depreciation to determine the basis upon which to figure the rate of return, theoretical and absolute depreciation, adopted the latter method in that case, deducting merely the observed, existing depreciation. The Board found the cost of reproduction new \$4,950,980, including \$250,000 working capital (cash, materials and supplies), from which was deduced \$200,980 on account of depreciation, that is, 4.3 per cent., leaving the present value \$4,750,000. If depreciated theoretical present value had been used by the New Jersey Commission a deduction from the reproduction value of the physical property would have been made, amounting to 15 per cent. or 20 per cent., say \$600,000 to \$800,000, instead of only 4.3 per cent., an amount which was actually less than the cash working capital allowed. The Board's measure of depreciation was a deduction of such sum as in its judgment would be sufficient, in their own language, "to place a given property in first-class operating condition."

The Commission expressly rejected the theoretical method of arriving at the depreciation that should be deducted from reproduction cost new as a basis of rates.



The Public Utility Commission of New Jersey, following the principles adopted in the Passaic Gas case, that deduction for depreciation should be based upon inspection rather than theoretical amounts computed from estimates of expected life, held in the case of the Delaware & Atlantic Telegraph & Telephone Company:

"The magnitude of the utility's responsibility is therefore the sum of the unexpired service value of tangible property plus the pecuniary liability to make replacements as needed from its own pocket. As its responsibility is measured by a sum in excess of the unexpired service value of its tangibles, it would seem to us that the equitable base upon which it is entitled to a return is in excess of the unexpired service value of its apparatus, and approaches as a limit the total replacement cost new of its tangible property.

"On the other hand it would appear that an allowance of replacement cost new of tangibles as the base on which a return is to be allowed (so far as tangible property is concerned) might in certain circumstances be excessive. In comparison, for example, with a utility which has to-day in its plant tangible property of a service value equal to the service value new of its original investment in tangibles, or which has accumulated a fund sufficient at any time to replace in full the expired service value of its tangibles, the utility which has done neither of these things but simply lies under the naked obligation to make such replacements as required, is less meritorious and is deserving of somewhat less allowance in the base for return. There is a greater assurance in the former case than in the latter of prompt and adequate addition of needed items when without such additions a service of 100 per cent. efficiency would be lacking." \* \* \*

"While we are not confident that in the Knoxville Water case the Supreme Court of the United States had before it any record of each and every consideration properly to be considered in the matter of making deductions from the replacement value new of tangible property, it is tolerably clear that this deduction or abatement here proposed is wholly in keeping with the valuation rule that seemingly may be deducted from that opinion. Such abatement or deduction is only a fraction of the total expired service value of tangible property in this particular case. This moderate reduction has also this advantage: that it is based upon certainly ascertained inspection or investigation, and not upon the more or less conjectural allowances for depreciation estimated by tables purporting to give the expectation of life of various parts of the utility's plant."<sup>1</sup>

<sup>1</sup> Report and Order of Board of Public Utility Commissioners, in the matter of Gately and Hurley *et al.* vs. Delaware and Atlantic Telegraph and Telephone Company, decided January 7, 1913.

The New York Public Service Commission, in Nos. 154 and 156 (the Buffalo cases), found present value to be the investment made by the owners, plus the unearned increment on real estate.

"Upon this assumption it is absolutely just to the public and to the company to compute the annual return for use of capital upon the basis of the investment, and so long as the company continues to give good service it will be entitled to an annual return upon that amount, because that is what it has in the business."<sup>1</sup>

The Public Service Commission of Nevada, in the Ely Light & Power Company decision, recently decided that present value was the cost of reproduction new despite the arguments advanced by some as to the decision of the Supreme Court in the Minnesota rate cases. The Commission distinguishes the Minnesota cases, where the question at issue was whether the rates were confiscatory, from the ordinary and usual case of establishing fair, just and reasonable rates. The Commission states that the Court in that case

"nowhere lays down the rules that in the actual work of rate-making, the body which is invested with such power must consider only the depreciated value. It does not follow that when such a body makes a reduction in rates, it must cut to the very lowest point at which the rates as prescribed would be sustained by a court. \* \* \* In regulating public service utilities there is much to be considered, separate and apart from the mere question of rates. While it is well settled that the rates shall be reasonable, the question of their reasonableness is to be determined by a consideration of every fact and circumstance which has a bearing, and also by a consideration of the principles of sound public policy."

The Nevada Commission fixed rates and

"reached its conclusion on the basis of the reproduction value (new) of the company's property \* \* \* after having added to the unit cost prices of their engineer, made up on the basis of reproduction value new, an additional 20 per cent. \* \* \* for cost of engineering, superintendence, contingencies and interest during the construction of the plant."

In the case of *City of Helena vs. The Helena Light & Railway Company*, Public Service Commission of Montana, decided Nov. 3, 1913, Sixth Annual Report, 194, at page 196, the Com-

<sup>1</sup> Public Service Commission, State of New York, Second District, *Louis P. Fuhrmann vs. The Cataract Power & Conduit Company*, decided Apr. 2, 1913, P. S. C. R. 2d Dist., Vol. III, page 723.

mission, after finding that the cost of reproduction new of the physical property amounted to \$250,000, says:

"Whether or not the valuation thus obtained is subject to depreciation and, if so, to what extent, is a matter of expert opinion, depending upon the amount expended for maintenance, renewals, and permanent improvement work, the period during which such amounts were expended and, in general, the 'state of repair' of the property. It will be obvious that there can be no fixed percentage of depreciation applicable to a utility that had been 'kept up' from year to year by constant effort, and the purchase of improved devices, as compared with one that had been allowed to deteriorate through neglect; hence the principle of an arbitrarily established measure of depreciation is untenable.

"Assuming that rates were being made for a new plant, it would be the total capital that must be considered as entitled to bear interest, as there would be no accrued depreciation. Depreciation is a liability against the allowance for future depreciation which, it is assumed, has been taken care of. To simplify the matter, let us assume that an investment is made in 1903 of \$100,000 under a 20-year franchise, rate of interest allowable 10 per cent. per annum, and figuring 5 per cent. per annum depreciation. At the end of 10 years, or in 1913, the property will have depreciated \$50,000 and has a remaining value of a like amount. Then if rates are made, based on the depreciated value, they must be one-half of the original rates, although the service may be just as efficient as it ever was, and in 10 years more the physical value of the plant would be nil, and likewise upon the same basis of reasoning, the utility would not be permitted to charge anything."

The Wisconsin Commission, in *Fullmer vs. Wausau Street Railway Company*, 5 W. R. C. R. 114, at page 127, says:

"If the present value exclusively were to be taken as a basis, respondent would not receive credit for having installed any part of its plant at full cost. The present value, as of June 30, 1908, must, therefore, be increased by the amount of the estimated depreciation on that part of the plant which the company installed new."

The same Commission, in *Hill et al. vs. Antigo Water Co.*, 3 W. R. C. R. 623, says:

"Of the physical plant alone, the most equitable valuation for rate-making purposes appears to be best represented by the original cost of the plant and by the cost of reproducing it."

The same Commission, in *City of Whitewater vs. Whitewater E. L. Co.*, 6 W. R. C. R. 132, at page 138, says:

"As it is a general rule that the reasonable return which a utility is allowed to earn covers interest and depreciation on the actual investment in the plant, it becomes important to know what the investment in the plant actually is, that is, what is the value of the plant new. The fact that the property of the utility has diminished in value with use, as the inevitable result of depreciation, does not lessen the amount of the investment in the plant for rate-making purposes."

The Public Utilities Commission of Connecticut has fully accepted the theory here contended for in the case of *Herbert O. Bowers et al. vs. Connecticut Company*, Docket No. 8, page 11, as follows:

"We do not think that the original cost of construction, whatever that may have been, the price paid for the line by the Connecticut Company, whether exorbitant or otherwise, or any inflated value for the issue of stocks or bonds are proper standards to determine the value of the plant and equipment for which the company is entitled to receive a fair income; but the cost of reproduction at the present time in this particular case is a more accurate standard, and the one which the Commission has followed in determining such value."

**Individual Opinion.**—Commissioner Erickson, of the Wisconsin Commission, in his paper before the Indiana Sanitary and Water Supply Association, dated Feb. 15, 1912, on page 10 says:

"When the plants are constructed to meet public needs and when deemed as of great or of greater value than their cost; when those who furnish the capital did so in good faith; and when ordinary judgment was used in all matters pertaining to the undertaking, then it would seem that there is little room for questioning the fairness of the actual cost."

And again, at page 24:

"Cost, both reproduction and the original, as explained herein, for industries where monopoly conditions obtain, represent the rights of the investors and the obligations of the consumers and furnish equitable bases upon which to adjust the relations as between these two classes."

And again, at page 37, of the same paper:

"On the whole the value that is just to both investor and customer is that value which is represented by costs. A reasonable valuation of the sacrifices involved in furnishing the service constituted the fairest basis for just charges. Upon this amount the investors are ordinarily entitled to reasonable returns. The cost appears to be the best and safest basis, not only for valuation, but for earnings or rates."

"*Hill et al. vs. Antigo Water Co.* (1909), 3 W. R. C. R. 623.

In re Menominee & Marinette Light & Traction Co. (1909), 3 W. R. C. R. 778.

State Journal Printing Co. *et al.* vs. Madison Gas & Electric Co. (1910), 4 W. R. C. R. 501.

City of Milwaukee vs. Milwaukee Gas Light Co. (Aug. 14, 1913), 12 W. R. C. R., No. U-234."

Mr. Cromwell, chief engineer of the New York Public Service Commission, Second District, in the Westchester Lighting Company case testified as follows:

"As a general proposition in considering depreciation, it must be remembered that the respondent is required to furnish 100 per cent. of service, with the plant as it exists, and is entitled to a fair return upon 100 per cent. of investment value" (page 6).

Q. It doesn't make any difference to the consumer whether the gas main supplying his premises is one year old or fifty, assuming them to be equally efficient?

A. Not if satisfactory and adequate service is rendered.

Q. It doesn't make any difference to the consumer whether the holder in which the gas which he consumes is stored, is five years old or thirty, assuming an unimpaired service value?

A. Not if satisfactory and adequate service is rendered.

Q. Does the failure of the owner of the property to lay aside reserve for the replacement of property in any way affect the consumer?

A. Not if satisfactory and adequate service is rendered" (pages 3122-3).

✓ Prof. George F. Swain, engineer of the Massachusetts Joint Commission, established in 1910 to ascertain the relation between existing capitalization and property value in the case of the New York, New Haven & Hartford Railway Company, in his report, says:

"If, then, the company is to keep its railroad as good as new, so far as operating is concerned, or perhaps in view of what has previously been adduced better than new, charging the cost of repairs and renewals in kind to operating expenses, it certainly ought to be allowed a capital corresponding and to charge rents sufficient to allow of such repairs and renewals. It is the duty of the railroad company to maintain this property practically as good as new, and the State has power to compel the owners of the property to do so. Portions which are worn out must be replaced out of operating expenses, and for the purposes of operation the property is always as good as new. If, therefore, the valuation is for the purpose of justifying rates or capital, 100 per cent. valuation should be taken."

Mr. Bion J. Arnold, an engineer of national reputation, a man who has been much employed by the public, by many of the principal cities as Chicago, New York, San Francisco, Cincinnati, Toronto, etc., in a statement made by him before the American Institute of Electrical Engineers, in 1911, takes the position that the "fair rate of return" should not be based upon the depreciated value of the property, in the following language:

"I maintain and always have, when you are considering a question of rate-making, that the company asking for the rate should be allowed a rate based upon the cost to reproduce the property new, taking into consideration the development expenses which I have mentioned, and that a condition precedent to that valuation requires the property to be in first-class condition so as to be able to give first-class service and if the property is found to be in bad physical condition, that the company has no right to ask that the rate be based on the cost to reproduce new, unless the company has in its treasury, or has somewhere a depreciation reserve fund, such as we have in Chicago, provided of course it has been able to earn such a fund sufficient to put the property in first-class condition, so as to give a first-class service, which is what you require of it, and which is the condition you require it to be kept up to in order to entitle it to the rate you give it.

"Many communities will attempt to fix a rate upon the depreciated value of the property. I think that is a short-sighted policy from the standpoint of the public, because if the rate is fixed on that value the company has no chance to raise enough capital to put its property in first-class condition, to give first-class service, and consequently the rate should be based upon the capitalization to reproduce the property new."

Dr. Alexander C. Humphreys, a leading consulting engineer and a practical operator of utilities, who is recognized as a noted student of the questions here being considered, said:

"Finally, nothing that I have said as to the determination of actual 'depreciation' is to be taken as an admission that in a rate-fixing case any deduction should be made from the appraised cost to reproduce plant new to cover so-called accrued depreciation, or, more correctly speaking, the accrued liability against the stockholders for final renewals or replacements. This is a liability resting against proprietors; and they must be given the normal opportunities to meet this liability without in the meantime suffering confiscation of investment by anticipation of the dates when the several payments to meet this liability may fall due."

"To me it is clear that in appraising the physical portion of a property to determine its measure in capital, no further deduction for depreciation should be made than is measured by the cost of restoring the parts to their full efficiency for production, and therefore that its condition as to obsolescence, inadequacy, and physical decay and not its age should determine the deduction, if any, to be made. If there is an accrued depreciation in excess of the actual depreciation found as above, the cost of renewal must be paid for from income. In the long run no injustice is so done to the consumer of the product, because the consumer, first or last, should pay for the maintenance of the plant at its original cost, provided the profits, whether paid out in dividends or carried into surplus, are not found to be unfair; which is the very question at issue and to be determined in these rate cases. \* \* \*

"In the appraisal of a plant to determine the investment upon which a 'fair return' (whatever that may be determined to be—varying with the general and local conditions) is to be calculated, it is not by any means clear to me that there should be any deduction for depreciation provided the plant is found to be in a condition to render efficient service to the public. Certainly no such deduction should be made if the income has not been sufficient to maintain the plant, provide for accruing depreciation, and afford a fair return on the investment."<sup>1</sup>

**Illustrations.**—It would seem that however useful estimates of life of property may be in establishing annual rates of deterioration, for accounting purposes, theoretical depreciation has no place in determining the basis for fixing rates of return. If so, by what method is theoretical depreciation to be determined? At which month in the life of the physical property which extends over years is the present value to be estimated? Assume that the life of a large part of a complete property is 20 years, then at the end of 19 years and 6 months, if theoretical depreciation is considered, the present value of the property would be small and the rates based thereon would include nothing in the way of return on a large part of the property, still 100 per cent. useful, a year thereafter the property being entirely replaced and new, the rates would be incomparably higher and between these two extremes, the rates will fluctuate depending on the year or the month in which the present value is estimated. Consider two surface railways running out parallel avenues from the center of a city to the suburbs, both alike in construction but one 10 years old and the other put in operation within a year. If

<sup>1</sup> Lecture Notes on Business Engineering by Alex. C. Humphreys; Second Edition, 1912.

theoretical depreciation is considered the present values of these two properties are quite different, the older road being worth appreciably less than the new road, although the original cost of installation may have been the same in both cases. Under such circumstances, is the older road to be allowed to charge only a 4-ct. fare, assuming that that gives a fair return on the estimated present value, while the new road must charge a 5-ct. fare for the same return on its estimated value? What would be the result practically of such method of fixing rates? The old road would be swamped with business and the new road would be unable to maintain its earnings. Again, the theoretical present value of the property of a lighting company might be found to be 50 per cent. of the cost new but such value would not properly represent its worth in service to the public because it would probably be in such poor condition that continuous and satisfactory service could not be rendered and the real worth and service to the public would be very much below 50 per cent. On the other hand, through extravagant management, and the replacing of partly worn out apparatus before economically necessary and the incurrence of abnormally high maintenance charges in order to maintain the theoretical present value of the property at say 90 or 95 per cent., there would result unnecessarily high operating expenses and unwarrantable charges upon the public merely for the sake of maintaining a theoretical high present value on which a fair rate of return must be allowed. A property of this kind maintained at an abnormally high present-value worth, would be of no greater service to the public than one of which the present-value worth might be only 75 per cent., whereas the burden to the public in maintaining the former property would be very much higher than the latter. Can such fanciful and variable bases be intended by the Supreme Court to be taken as that on which rates are to be estimated and regulated? Such conclusion would be illogical, unreasonable and unfair. Provided a property is kept in good order and at 100 per cent. working efficiency so as to render service to the public equivalent to that of a new plant, the question of rates or value of property in its service to the public has absolutely nothing to do with the amount of reserve funds the corporation may or may not have accumulated. The value of any physical property, as must of course be recognized, has no relation whatever to the amount of money a corporation may have to its credit in the bank,



nor have rates for service, as far as we have ever heard, been based on the amount of a company's surplus or reserve funds.

"The writer has before him, professionally, an estimate, made by an engineer of a State, of the present value of a line of railway. This railway was constructed as one task within a period of about two years, and cost about \$5,000,000. The property was operated for some special traffic during construction. The valuation was made as of a date about 20 months after the road was turned over to the operating department. The State engineer finds its original cost and its reproduction cost; and then he estimates the 'condition per cent.' of each item of physical property, and averages them for the total, with the result that he estimates the present value—the value on which the owner is entitled to a return without interference by the State—as 95 per cent. of the amount of present cost of the property. If the property actually and reasonably cost \$5,000,000 two years before this valuation was made, and could reasonably be reproduced at the time of the valuation for not less than that amount, as might well be assumed, then, if the owner shall be limited at the time of the valuation to a return on only \$4,750,000, it seems to be clear enough that somewhere he has wholly lost, or has at least lost the valuable use of \$250,000. There is no force in the suggestion that he is entitled to earn and lay aside this \$250,000 during this period of two years in which depreciation is alleged to have accrued. Even if he shall be able to earn it, he may not consider it as a return of a part of his investment and devote it to his private use as such. He is under *exact obligation to use it in replacing the depreciating articles when they shall have depreciated to the point of ineffectiveness* (italics are the author's). In other words, because the proper maintenance of the property is the very first charge against the earnings of a railroad company, and because the property must be maintained ordinarily in perpetuity, money properly necessary for replacement of portions of the property when they shall have depreciated into inefficiency, and reserved by the company for that purpose, may just as well be said to be devoted to the public use as may the physical property of the company actually used in operation. It may, perhaps, be invested by the company until the necessity for its use arises, but if the investment proves unfortunate and the money is lost, it must be replaced, and, apparently, at the expense of dividends which otherwise might be properly payable; and, if the depreciation fund is invested and produces income, of course that income ought to be included in the general income of the company on the net of which the reasonableness of its rate of return is to be figured."<sup>1</sup>

<sup>1</sup> Jared How, Esq., *Proceedings of the American Society of Civil Engineers*, Vol. XL, No. 2, February, 1914.

Until comparatively recently, practice has paid too little attention to the necessary allowance to be made for the element of depreciation. In order to show net earnings that would maintain the credit of the utilities, or warrant the issuance of additional securities, or, in some comparatively few instances, to permit payment of unwarranted dividends, only that part of the total depreciation annually observed, namely, wear and tear, has been provided for; the remaining portion of depreciation, namely, renewals and replacements, future inadequacy or obsolescence, the demand for which was not yet apparent, has been deferred perhaps without full appreciation of the fact that theoretical depreciation must eventually be provided for just as surely as ordinary maintenance expenses, if the property is to be continuously maintained in first-class operating condition.

"The question whether depreciation is a proper operating charge is no longer open to debate. The opinion of Mr. Justice Moody, already cited, reflects the generally recognized rule that rates should be sufficient to permit current repairs to be made, parts to be replaced, and other charges met, so that by one means or another the investment may be kept unimpaired. In order that this object may be attained, every part of the property must be considered, and wherever there is decrease in value, provision must be made for an offset in one form or another."<sup>1</sup>

Of course, this estimated cost of future renewals is as much a part of the annual operating expense as is the cost of wages, fuel, current repairs, taxes, or interest, and if not included in the annual expense, the net profits are incorrectly stated. Due largely to the demands of the public for reduced rates, and the insistence on the part of regulatory bodies that utility properties be maintained in first-class operating condition, there has recently resulted general recognition of the necessity for providing for those elements of deterioration which are silently accumulating in the present, although not demanding expenditures until some time in the future. While, of course, it is impossible to keep property at 100 per cent. condition of its investment value when taking into account theoretical depreciation, which is accruing but not accrued, it does not follow that value for rate-making should be based on anything less than the 100 per cent. value. To require a utility to maintain its investment at practically 100 per

<sup>1</sup> *In re Queens Borough Gas & Electric Co.*, 11 P. S. C. R. 544.

cent. value would mean the renewal of parts long before they were worn out, that is, a deliberate waste of material and equipment in which there still remains large service value simply for the purpose of permitting the investor to establish a basis on which to earn a higher rate of return.

With all the smaller utilities it is necessary to provide a depreciation reserve fund for the purpose of spreading the cost of final renewals of deteriorated property equally over the life of such property. While this setting up of a fund results temporarily in decreasing funds available for dividends to stockholders, nevertheless, in the end the stockholders receive the same amount, because if the fund is not set up, all earnings being paid out as dividends, when the time arrives for the renewals and replacements, no funds being in hand, their cost must be taken from net earnings in such large amounts as to cause a temporary deficit, or certainly the material reduction or entire discontinuance of dividends. Moreover, the credit of a company is much better maintained where the annual operating expenses are maintained nearly uniform, and where the stockholders receive fairly constant dividends. Again, the public will better understand the relations between the public and the stockholders under constantly maintained conditions than in cases where abnormally large dividends are being paid a portion of the time, and no dividends, or proportionately less dividends, are being paid the remainder of the time.

**Reserve Funds.**—Where property is in first-class operating condition, authorities both technical and legal generally agree that, in order to ascertain the total value of the utility just and proper to be used as a basis of fixing rates, there should properly be added to the value of the depreciated property the amount of reserve fund on hand, in cash or in property, if that fund has not already been included as a part of the property being appraised. It is only in case the reserve depreciation fund does not equal the amount of estimated depreciation or where a fund is not available in cash or property that some authorities claim depreciated present value should be used as a basis of rates. The difference of opinion, therefore, between those who deduct from reproduction cost new the amount of computed or accruing depreciation and those who make no deduction in determining the value for fixing rates is as to the amount of the depreciation fund and whether or not it is what may be termed a "liquid asset." It is

somewhat difficult to understand exactly why this difference in method and principle should be adopted simply because a corporation may or may not have "liquid assets." If a corporation has good credit it does not need quick assets because cash can be quickly raised in case of emergency, and it is therefore unnecessary to keep a part of its assets "liquid."

It is frequently argued that if proper depreciation reserve funds have been accumulated by a corporation, the amount of such fund added to the present depreciation value of the property would equal the cost of reproduction new.

As a matter of fact, the reserve funds maintained by a company have nothing whatever to do with the value of the property on which rates should be based. Reserve funds are maintained for various purposes, and it is due to failure to distinguish between the several classes of reserve funds and their purpose, together with lack of appreciation of the meaning of depreciation, that is the cause of the illogical attitude of many minds on this subject.

Reserves are set up or accumulated for the following purposes:

(a) To provide a "surge tank" which will serve to equalize the fluctuation in expenditures necessary to maintain the property in first-class operating condition. The fund is provided for the purpose of evenly distributing the cost of final renewals of the various parts of the property, over the space of time assumed to cover the period of life during which the several parts are expected to render effective service. This uniformity is obtained by annually charging against revenue and as a part of operating expense a fixed amount, for each class of property, determined from a consideration of its value and assumed normal life, including such additional allowance as is necessary to cover functional depreciation, thereby making possible the maintenance of constant rates for service and fixed dividends. If all parts of the property were short lived, terminating within a few months after installation, every utility property after the first few years would have practically a uniform expenditure for renewals and repairs, and in that case would require no reserve account to act as a "surge tank." It will be seen, however, that, as is the fact with all utilities except the largest, certain parts of the plant cost relatively large amounts of money with lives extending over a period of years, making it necessary to lay aside annually a definite sum, which yearly sums, with or without the interest

accruing thereon; together with the sum obtained by the sale of scrap, will aggregate an amount, at the end of the life of the property, equal to its original value, in order to permit its replacement without the issuance of new capital by the corporation and without unduly increasing operating expenses for the year in question, thereby either necessitating temporarily high rates or compelling the investors to go without dividends. Depreciation funds of this "surge tank" character, provided by payments of the consumer for the service rendered, do not return to the investor any of the capital originally put into the enterprise by him; they simply maintain his investment and keep it intact, as all interest on such reserve funds is, or should be, applied to and made a part of the fund itself, thus helping to increase the fund, and to that extent reducing the amount that must be paid in by the consumer. It will be recognized that the reserve funds, of the character herein being discussed, have nothing whatever to do with fixing the value of the property upon which owners are entitled to a return. A reduction of the original investment or the cost of reproduction new, or by the theoretical amount that may be estimated should be on hand or accumulated in the renewal or "surge tank" reserve fund, is confiscation of a part of the property, as well as a permit to the consumer to contribute for the requirements of renewals an amount less than that actually necessary because calculated on a partial, instead of the full, value of the property being used. Authorities have been misled, in considering the subject of depreciation, by assuming that the amount paid by the customers for the accumulation of a depreciation fund were payments made as a return to the owner of a part of his investment, instead of realizing that such payments were made for the purpose of equalizing maintenance and must be imposed in addition to payments for normal wear and tear. The total of all these payments, being simply to provide for the different classes of depreciation, are used solely to maintain and protect the property, without in any way reimbursing the investor. Where sinking fund, improperly called depreciation fund, accumulations are used to pay off capital investments, the difference, that is, the remainder only, after deducting the payment made from the original investment, should be used in fixing rates, but where funds are accrued merely as a "surge tank," to take care of renewals, both the fund must be accumulated and the fair return paid on the investment out of contributions by the

consumer. It would be illogical and unfair to claim the investor was not entitled both to a fair return upon his property and also necessary funds for its maintenance in 100 per cent. condition, the same as he is entitled to other operating expenses and taxes. It is difficult to see how such elementary principles have been disregarded, even by some who are assumed to have knowledge and experience in these matters. The California Railroad Commission in the Palo Alto Gas Company case said:

"the company cannot consistently work for a return on its property as if it were new, and also expect to set aside a depreciation fund."

Why the company in that case should not expect a return on its investment and also the setting aside of a sufficient fund to be ultimately drawn upon in maintaining its property and protecting its investment, is difficult to see.

During the entire period that utility property is rendering service to the public, the owner is entitled to a fair return upon its full value, which, upon the start, would be universally recognized to be the amount of investment fairly and judiciously made. It is the part of the individuals receiving the service rendered by this property, that is, the consumers, to pay to the owner whatever amount may be necessary to maintain the property and keep the investment intact. The purpose of a depreciation fund is to maintain the integrity of the plant and the investment. Annual payments by the consumer to cover wear and tear, repairs and renewals do not go either as dividends or return of investment to the stockholder, but have their own province, namely, to maintain the property. At no time during the life of the property under normal conditions can there be, nor can there properly be alleged to be, any impairment of the value of the owners' investment. The customer is responsible for the annual accruing liability on account of all classes of depreciation of the plant, and it is customary to require this liability to be paid by the consumer, in equal amounts regularly, as bills for service are rendered. After the payment of such obligation, the consumer has no further interest in the property, as long as the quality of the service is maintained. Therefore, the application of the amounts paid the owner for renewals cannot in any way affect the value of the property continuing to render the service desired, provided always the property is maintained in condition to give first-class service. Whether the payments to the owner by the

consumer, on account of renewals, have been deposited in a reserve fund or not, makes no difference whatever in the value upon which the customer must pay a return, because the owner is, after payments have been made by the consumer, liable for the replacements, which liability is not affected by the existence of a reserve fund. The deduction of any amount equivalent to an estimated fund, from original or reproduction cost in determining the basis for earnings or rates, is purely arbitrary and without justification in logic, economics or engineering.

(b) Public utilities are operating either under a limited or an "indeterminate" or unlimited, franchise. Where the franchise is unlimited as to duration, it may generally be assumed that the utility will continue the use of its property in the service of the public indefinitely. Under such conditions there exists no necessity for the accumulation of a sinking fund sometimes called a "depreciation fund," or "reserve fund," to pay back to the investor the value of his property. On the other hand, where a franchise is limited to a definite term of years, or where for other reasons the life of the utility is fixed, it is necessary during the period of its existence for the utility to accumulate a separate and distinct fund, that at the time necessary to reimburse the investor the amount of the fund, together with the cash received from the sale of scrap or salvage, will equal the value of the property. This fund must be accumulated from year to year by payments made by the consumer for the service he is receiving, and has nothing to do with depreciation, renewal, or "surge tank" funds, previously discussed, the sum of all of which must be included as part of the cost of said service. In some cases it may not be necessary that an actual sinking, or reserve, fund be accumulated. In practice it may be possible at the end of each year to immediately pay back to the investors the amount of capital paid in by the consumer for that particular year; this may be done, for example, by using the amounts collected from the consumer in paying off bonds, called by allotment, or any other indebtedness of the company, but it is not always possible to work the matter out in this way, because of the relatively small amounts paid annually, which on this account are unacceptable to the investor.

Similarly, if instead of making annual payments to the investors on account of principle, the contributions of the consumer are allowed to accumulate in a reserve fund, which may be

invested, provided the investment is a "liquid asset" available for promptly paying the investor in the corporation when the payment becomes due, the earnings of the reserve may be either added to the reserve thereby the more rapidly effecting its accumulation, or the earnings may be paid to the owner direct, thereby reducing by that amount the return that may be exacted from the consumer in paying for the service rendered.

It will be of course recognized that in all such cases as these now mentioned, where the corporation can pay back to its owners certain portions of their investment, year by year, and the latter thereby get part of their original investment out of the property, the amount of such payments on account of principle must be deducted from the original investment or the present reproduction value new of the utility, in determining the sum upon which to fix rates or the proper amount upon which the investor, thereafter, is entitled to a fair return. It is due to this very proper, although perhaps somewhat exceptional application of a part of revenue and the payments, by the consumer to the owner, of the amounts of the original investment, improperly called depreciation, that has confused the lay mind and resulted in a demand for deduction of all reserve funds, or theoretically computed depreciation from the original or reproduction value of the property in determining present value.

(c) All utilities are liable to contingencies and must provide for the unexpected. In order to carry a species of insurance, many corporations provide a contingency reserve fund which will amount to a relatively small percentage of the value of the property. This fund is nothing more than a "safety valve" which, under normal conditions, is maintained at a uniform amount, perhaps requiring no accretions, but under higher pressure conditions of financial stringency, strikes, fire, earthquakes, or other similar "acts of God" the fund is a quick asset that is drawn upon to meet the emergency. After the emergency, the fund must be replenished either by payments from insurance companies or some such source, or by contribution from revenue of a portion of the payments made by the consumer for the service rendered. It is to provide this contribution that small allowances, say 1 per cent. of gross revenue, are frequently made in fixing rates to be paid by the consumer. Such payments, however, being used simply to maintain a contingency reserve, do not result in any remuneration to the original investor or in any way



decrease the value of the property; hence the contingency fund cannot properly be deducted from original cost or reproduction new in determining the value of the property used in service to the public. If the fund has been accumulated out of payments contributed by the consumer, after commission rule was inaugurated, the owner of the corporation is entitled to no return on the fund. On the other hand, if the fund was originally established by the owner either by cash payment as an original investment or through the waiving of rights to a certain amount of dividends, thereby permitting the gradual accretion of such fund, the owner is entitled to a return on the amount of the contingency fund, and it should be included with the value of the other property in determining the total fair value to be used as a basis of fair return or in fixing rates.

**Depreciation Funds.**—The usual method of computing and making allowances for depreciation and depreciation funds are what is known as either the straight line or sinking fund method. Both methods are widely used and each has its ardent exponents. The straight line method has been more frequently employed than all other methods for the following reasons:

*First.*—Because the lives of much property and apparatus is brief, so that any method would not differ much in the final results.

*Second.*—The application of this method is the most simple, direct and easily understood, hence naturally favored, particularly by utility accountants and non-technical men who constitute so large a proportion of the regulating bodies and courts.

*Third.*—"The profit earned by the undertaking year by year is itself the full interest or increment accruing to the capital of the undertaking, and it is as unsound to forestall and apply future interest (as is involved by the use of the sinking fund) in a manner which operates to retain the surviving value of plant in the books at too large a sum, as it would be to apply interest to add to the value of unsold stock or unpaid debts in which a large part of the capital of industrial undertakings is locked up, and for this reason it is a misuse of the sinking fund to apply it as the measure of the annual depreciation of plant."<sup>1</sup>

The Public Service Commission of New York, First District, has always used the straight line method and the reasons therefore have been testified to by Ex-Commissioner Maltbie as follows:

<sup>1</sup> "The Use and Misuse of the Sinking Fund," by P. D. Leake.

"Q. (By Chairman Hughes). May I ask you why you prefer the straight line depreciation to the sinking fund plan? A. Why I prefer it?

Q. Yes, why you select that, considering both funds would be invested, one in extensions to the property and the other on the side, and earning an interest? A. In the first place, ordinarily that is the method which is adopted and more easily understood by the company's operating public utilities. Secondly, unless great care is taken in maintaining the sinking fund and credits are made to that fund of the interest as compounded year by year, you will not have a sufficient amount when replacements become due, and it is fundamental that it shall be followed by strict mathematical accuracy, or it will not work out properly.

Q. That is to say it is more complicated than the other? A. It is more complicated than the other.

Q. Not as easily handled? A. And in the third place, if retirements are necessary before the end of the estimated life, or if repairs occur in the earlier years for part of a group, the sinking fund method will not work out because in the earlier years it grows very slowly and then in the later years of the period, grows very rapidly; consequently a little deficiency in the earlier years, in the fund, will very seriously affect the amount which will be found in the fund at the end of the time."<sup>1</sup>

The Railroad Commission of Wisconsin use both the straight line and the sinking fund method, preferring the latter except where the life of property is rather short. The views of the Wisconsin Commission are briefly set forth in the following:

"There are two methods in common use among public utilities, outside of steam railways, for determining depreciation. One of these is known as the straight line method. Under it the life of the unit is determined, and it is then assumed that during this life the depreciation is uniform. For units having a life of ten years, one-tenth of their cost is then set aside annually for their replacement. When of these ten years, five have elapsed, the unit is supposed to be worth only one-half of its original cost, or of the cost of replacing it. This method is comparatively simple and has been widely used.

The other method is based upon a slightly different theory. In this case it is assumed that the amount set aside annually for depreciation should be invested at compound interest, and that the amount so set aside, plus the interest, will be sufficient to cover the replacement at the end of the life of the property. Since in this case the interest also is made a part of the fund, it follows that the amount that must be

<sup>1</sup> Testimony of Hon. Mil. R. Maltbie before Ohio Public Service Commission in re Bucyrus Light & Power Co., Jan. and Feb., 1914.

set aside each year is smaller than it would be if interest was not allowed or included. Under this method the value of the unit at any intermediate year during its life is its first cost, or the cost of reproduction less the amount of the sums set aside, including the interest on the same.

Under the first of these plans the drop in value is the same each year during the earlier life of the unit. Under the second method the drop is light at first, while the amount set aside is small, but it increases as this amount grows large, and toward the end of the period it rises quite rapidly. For short life units the difference between the two methods is probably not very material. For long life units, on the other hand, the difference may be of importance. This is especially true when there are changes in the ownership. Since under the latter method the fall in the value is greater in the latter than in the first part of the period, it would also seem that depreciation would fall heavier on purchasers than on sellers of such plants."<sup>1</sup>

The courts have rather leaned to the simpler, more direct straight line method for estimating depreciation allowance.

"The courts below determined that the relator was entitled to make annual depreciation charges, amounting in the case of the borough of Manhattan to the sum of \$360,613.65 and in the case of the borough of the Bronx to the sum of \$37,435.67, for the purpose of creating a fund to provide for the depreciation of its various properties; upon which interest at 4 per cent., compounded, would produce a sum, at the termination of the ascertained physical life of the several classes of property equal to the cost of the particular property. While I am, personally, of the opinion that the creation of such an amortization fund furnishes the best rule for adoption in such a case as this, in working out the value of special franchises, the majority of my brethren entertain a different view. They think that the annual allowance for depreciation should be computed by dividing the values of the various kinds of tangible property by the number of years of their respective estimated physical lives and that will be the opinion of the court."

"The special term in this case, however, adopted a plan of amortization upon which an annual sum was authorized to be set apart as a sinking fund, which, by compounding the interest thereon for a period equal to the life of the structure, tracks, engines, machinery and rolling stock, would at the end of that period create a fund sufficient to replace the property. The difficulty with such holding is that railroad corporations do not reconstruct their railroads and rolling stock in that way. In order to afford proper protection to the public they are required to maintain a high state of efficiency both in roadbed and

<sup>1</sup> Hill *et al.* vs. Antigo Water Co., 3 W. R. C. R. 643.

rolling stock. The relator's railroad has been in existence already for about 30 years and some portion of its property has already suffered from decay and use to such an extent that portions thereof have to be reconstructed and made new each year. Old ties have to be removed and replaced with new ones; old rails that have become worn and battered have to be removed and their places supplied with new rails and so the work of reconstruction progresses from year to year. It is not the waiting 40 or 60 years to reconstruct, during which time the amount set apart as a sinking fund may be doubled many times over by compounding the interest, but it is the annual expenditure for reconstruction which is to be paid for at the time that the construction is made. To illustrate: Suppose the average life of the tangible property of a railroad, outside of the land itself, to be 60 years and the cost of reconstruction to be \$60,000,000, it would follow that \$1,000,000 would have to be used each year in reconstruction, and that amount would have to be annually used for that purpose; but under the plan adopted in this case, instead of deducting from the gross earnings the amount necessarily expended for that purpose, a small fraction of that sum, viz., \$4,200 only is allowed to be deducted, a sum which, with the interest compounded for the next 60 years, would amount to \$1,000,000. Under such a plan the company would be practically prohibited from annually constructing a portion of its road and thus prevented from keeping it in that state of efficiency which the public demands. Of course the necessities of reconstruction vary from year to year; some years it may be greater than others, but the assessors each year can easily ascertain the sum required for that purpose. I think, therefore, that we should adhere to the rule sanctioned in the Jamaica case, and that a gross sum should be deducted annually for the purposes of reconstruction."<sup>1</sup>

"Of course our estimate could not be based upon the proposition that the *per centum* set apart to cover depreciation would be deposited in bank or loaned out from year to year so as to accumulate and be on hand at the end of 14 years, and to be then used to construct an entirely new plant, and so on from period to period. In such a case the public would not only have a service that would progressively grow worse until its operations ceased altogether, but it would thereafter get no service at all until a new plant replacing the old could be completed and put into operation. The question rather has been, What does experience show to be the proper average per cent. of annual earnings which the company should expend in order to insure that its plant at the end of 14 years will be as good as it now is, and in the meantime render to the public that good service which its duty to the public requires?"<sup>2</sup>

<sup>1</sup> People *ex rel.* Manhattan Railway Company *vs.* Woodbury, 203 N. Y. 231, Oct. 17, 1911.

<sup>2</sup> Cumberland Telephone and Telegraph Co. *vs.* City of Louisville, 187 Fed. 637, Apr. 25, 1911.

The Public Utilities Act of the State of California, Section 49, reads:

"The Commission shall have power, after hearing, to require any or all public utilities to carry a proper and adequate depreciation account in accordance with such rules, regulations and forms of account as the Commission may prescribe. The Commission may, from time to time, ascertain and determine and by order fix the proper and adequate rates of depreciation of the several classes of property of each public utility. Each public utility shall conform its depreciation accounts to the rates so ascertained, determined and fixed, and shall set aside the moneys so provided for out of earnings and carry the same in a depreciation fund and expend such fund only for such purposes and under such rules and regulations, both as to original expenditure and subsequent replacement as the Commission may prescribe. The income from investments of moneys in such fund shall likewise be carried in such fund."

Commenting on this requirement of the California law and the necessity of preserving payments, made on account of depreciation, in a fund to be held sacred to provide renewals and replacements, Commissioner Thelen says:

"I desire to draw particular attention to the last sentence, under which the income from the investment of moneys in public utility depreciation funds in this State must be carried in the depreciation fund itself. In other words, the interest earned by moneys in the depreciation fund cannot be used for the payment of dividends or for meeting operating expenses. This fund, together with the interest on all moneys invested therein, is a trust fund set aside for the specific purpose of taking care of replacements, whether of worn out material or of material which has become obsolescent or inadequate, in accordance with such rules, regulations and forms of account as this Commission may prescribe. As the interest is to remain a portion of the fund, it would seem that ordinarily in this State the sinking fund basis should be used in determining the amount to be set aside annually in this fund."<sup>1</sup>

"During the term of life of the property the company gets no benefits of the annual payment made by the public. The interest accretions are added to the principal, and at the end of the estimated term the company simply has enough money to replace the property. During the entire period the company has the same amount invested or used in the

<sup>1</sup> Decision of the Railroad Commission of California, *Town of Antioch vs. Pacific Gas and Electric Company*, Case No. 400; Decision No. 1655, July 6, 1914.

public service, and therefore during the entire assumed life of the property is entitled to the same amount of annual return thereon."<sup>1</sup>

Mr. P. D. Leake, of London, an authority in accounting says, regarding sinking fund methods:

"I have noticed that these devices have an extraordinary attraction for many types of mind, and that too often the results expected are not attained. May I impress upon you that these devices are dangerous expedients in any but the most skilful hands. In practice, then, the sinking fund is merely a convenient method of accumulating a certain sum of money by a given date by means of annually investing a fixed sum of money in the meantime. It is apt to give a sense of false security, because its whole virtue depends upon its obligations being faithfully carried out over the whole period, and this condition is not always fulfilled. The reason is that the sinking fund discounts the future, and depends upon the performance of acts in the future, sometimes over a very long period, and no one can tell how in the meantime circumstances may alter and conditions change. It is probable that in many cases the use of a sinking fund is an altogether unwarrantable draft drawn upon the future, because there is no reasonable certainty that the fund, whether it be State, municipal, or commercial, will not be raided before it attains its object."<sup>2</sup>

The depreciation reserve fund is simply used to equalize payments over a long period of time, the same way that a flywheel absorbs and delivers energy at alternate intervals.

Where depreciation funds have been accumulated, the amount of such funds should be added to the depreciated value of the property—if such value instead of cost of reproduction new is used—in determining the amount upon which fair returns are to be allowed. This is the regular procedure followed by many public authorities and has been the practice of the Railroad Commission of Wisconsin for years:

"As under normal conditions investors are entitled to have their property or investment kept intact, it follows that the amounts, which have been properly set aside for such purposes, or for depreciation, in accordance with the provisions of the law and the rules of the Commission, should in the instant case be included in the amount upon which returns are allowed. On the other hand, amounts earned for deprecia-

<sup>1</sup> Public Service Commission, State of New York, Second District, Louis P. Fuhrmann vs. The Cataract Power & Conduit Company, decided Apr. 2, 1913, P. S. C. R., 2d Dist., Vol. III, page 717.

<sup>2</sup> "The Use and Misuse of the Sinking Fund."

tion but withdrawn or used for other purposes than provided by law should not be so included."<sup>1</sup>

**Value not Fixed by Depreciation Fund.**—Where a corporation is created under conditions prescribed in advance by regulating bodies, or where rates include such allowance, there can be no objection to the insistence upon the accumulation of depreciation funds out of revenue, but then such funds cannot necessarily be used as a measure of value of the property upon which rates are to be fixed, without regard to maintenance and condition, even if original investment and not present value is to be taken for all time as the basis of fixing rates. It will be seen that the attempt to determine present depreciated value by deducting from reproduction cost the amount of the accumulated reserve fund—assumed to have been accumulating from the origin of the corporation—results in an absurdity, because the fund is based upon an estimate related to the original investment. If the cost of reproduction new determined from a consideration of present values is first obtained and the amount of the accumulated reserve fund then deducted, the present depreciated value will be found excessively large, in the case of a corporation, the property of which has enormously increased in value, and the deduction of the same reserve fund from the cost of reproduction new of property that has largely decreased in value will give a present depreciated value entirely too small. So that even in the case of a corporation originated under public service rules and regulations and adhering thereto throughout its existence, cannot have its property value determined at any time in the future merely by deducting from the cost the amount of the accrued depreciation fund.

To further analyze the theory that present value should be determined by deducting from the investment or reproduction value the amount of a depreciation fund in hand, it must be remembered that the rate at which the fund is accumulated is an average one, and may be excessive or less than the requirements. If a newly organized corporation operating under commission rule begins accumulating a fund on the basis of generally accepted rates of depreciation, it might be easily possible that through some rather special circumstances, or contingency, a larger than normal amount was required to be withdrawn from the fund to provide for renewals necessary; therefore, the fund

<sup>1</sup> Superior Commercial Club *et al.* vs. Duluth Street Railway Co., 11 W. R. C. R. 21.

being largely depleted or perhaps entirely wiped out, the present value of the property, on the theory being considered, is reduced by the amount of the computed but lacking fund, necessarily expended; consequently the owners, through no fault of their own, simply because they have well maintained the property, are thereby deprived of a portion of the return due them on which they would receive under normal conditions.

In any case, if theoretical depreciation were to be considered, in determining present value, there is no logic or reason for figuring depreciation on all of the property in determining the amount to be deducted from investment or reproduction value. A large proportion of the values included in every appraisal does not depreciate and therefore, such non-depreciable parts should not be reduced by an estimated amount of depreciation which is applicable to other depreciable parts of the property.

"Now it seems that about half or more of the overhead is permanent, does not depreciate, and therefore, will not be required in reconstruction. For instance, it is held that only in total supersession do all overhead charges depreciate and that a normal depreciation allowance should not be based upon such assumption. It is held that certain charged for engineering and supervision do not depreciate and that cost of contingencies and losses during construction do not necessarily have to be replaced in their entirety. Also, that interest during construction is in the same category, while preliminary organization, promotion, development, administration and legal expenses do not usually have to be repeated in replacement."<sup>1</sup>

The argument that the allowance of appreciation in real estate values logically includes a deduction for depreciation, does not follow. Increase in capital account, which is the result of appreciation of land values is not in any way related to revenue and operating expenses, to which alone is depreciation chargeable.

Under the Interstate Commerce regulations, as well as those promulgated by most of the State commissions, and in accordance with the practice of well-run corporations requirements to meet both current and deferred maintenance are included as a part of the operating expense, to be deducted from revenue, before the payment of dividends. It makes little difference whether the allowance above that required for wear and tear is accumulated in a reserve fund or credited to the profit and loss account, in

<sup>1</sup> Decision of the Wisconsin Railroad Commission dated Nov. 25, 1913, Milwaukee Electric Railway and Light Company, 13 W. R. C. R. 228.



either case it may be available for taking care of renewals when they have accrued. As charges on account and wear and tear or renewals can be made only from revenue, there is no reason why it should be confused with the capital account or deducted from investment in determining value for rates. Failure to provide depreciation rests with the owner who must make good any deficiencies which may result from payment of dividends or other diversions of revenue, if earned, and in many cases, in order to protect his investment, even if not earned.

Any attempt to reduce rates by using present depreciated, instead of reproduction new values, is nullified, because, logically, as much higher rate of depreciation must be provided in the rate as the total value of the property is reduced. That is, if 5 per cent. is the proper rate to allow for providing for depreciation on the basis of reproduction cost, then, if the value of the property should be depreciated down to one-half reproduction cost, it follows that the rate of depreciation should be 10 per cent., making the charge to the consumer the same in either case, in order that funds may be on hand to renew the property at the expiration of its life. In the same way, the rate of return allowed the owner should be doubled if the theoretically depreciated value of the property is taken at half the reproduction value.

Moreover, there are few corporations which from the beginning can do business and charge rates sufficiently high to permit earnings large enough to provide for a depreciation reserve fund. Such being the fact with regard to newly originated corporations starting under public regulation rules, how much more it is evident that the value of property of long existing corporations which were required neither by public authorities or their own directors or stockholders to accumulate large funds can now have the value of their property determined by deducting from cost of reproduction new the amount of a theoretical reserve fund which will vary in amount depending on the method used in computation, and for which, at least in any large amounts, many authorities agree, there exists no necessity. In the second place, it may be seriously questioned whether there exists necessity for the accumulation of anything greater than a contingency reserve fund, except in the case of a limited franchise or where the life of a utility is definitely determined; in such instances there must be accumulated funds sufficiently large to ultimately return to the investor the full value of his

property. In exceptional cases there may be required no depreciation reserve funds whatsoever. A corporation that has its property widely distributed, of various characters with single units of relatively small value may not require any reserve, because, the deterioration of property—after the first few years of operation—is taking place at an approximately uniform rate per annum and therefore, all depreciation becomes wear and tear, and is taken care of as a part of the annual operating expense; as an example, the Third Avenue Street Railway Company, of New York City, may be cited. This property consists of nearly 300 miles of surface track, partly overhead and partly underground trolley, with rolling stock to correspond of all sizes and types, as well as storage battery cars, underground conduits, cables, overhead transmission systems, car barns, substations, generating station, real estate, and other property extending from the lower end of the Island of Manhattan up to and through the Bronx and the County of Westchester, so that the exhaustion of any physical property, as far as can be anticipated, will not result in unduly increasing operating expenses for its replacement, or affecting net income, or in any way jeopardizing service or charges to the public. Why then should this corporation be compelled to have on hand a reserve fund equal to the difference between cost of reproduction new and its theoretical depreciated present value, that is, a fund equal to 15 per cent., or 20 per cent., of the total value, namely, a fund of from \$9,000,000 to \$15,000,000 for which the corporation has no use, except to be allowed to earn a fair return on the full value of its property and from which the public will gain no advantage, because under public regulation the corporation is compelled to render adequate and reasonable service. Commission regulation always provides for proper maintenance and service, and this may be enforced and secured even to the exclusion of dividends. Take a case of a corporation which has issued only stock and has no bonds or mortgage indebtedness outstanding—as is not unusual in New England particularly—in such a case the entire investment of the stockholders is a guarantee of good service. Why then should a Public Utility Commission insist that the public be further guaranteed by additional security in the form of a depreciation reserve fund.

It has been argued that without a reserve fund a public utility owner is tempted to let his plant depreciate and to withdraw

from the property the funds necessary for its maintenance, but this is an abnormal and unusual condition. The valuations of a large number of utility properties of all kinds, made in all parts of the country by a host of independent and separate appraisers, result in showing that the average condition of utility properties in this country is usually between 80 per cent. and 90 per cent. of reproduction value new after deducting the amount of theoretically estimated and accruing depreciation. Consequently, it may be stated without fear of contradiction that the condition of the average utility plant is not run-down or giving inferior service, whether or not reserve funds have been maintained. If then the physical property of a utility plant is in a condition to render proper service, it is rendering it or not, depending upon the wishes of the corporation officials and the public authorities, but in either case the value of the property is the same. Similarly, if the property is in condition to render proper service, its value is the same, whether a guarantee of maintenance is secured in one instance by deposit of reserve funds, or, in the second instance, by the entire investment of the stockholders and bondholders. Who shall say that, because a given utility has not accumulated a cash reserve fund before public regulation was instituted, therefore the newly created Commission now has the right to deprive the corporation of a part of the value of its property? The value of utility property being determined and allowed by a Public Service Commission is admittedly not such value as would obtain from the sale of the several parts of the plant for use elsewhere, but rather that particular value due to the location, suitability and ability of the parts of the plant, used together, to render the service required in the community considered. If then the value of the property is fixed by its value for service and not by its exchange value, the full 100 per cent. value must be allowed when the plant is rendering 100 per cent. service and not some proportion of the full value, simply because some time in the future, in order to maintain the quality of the service, the different physical elements must be replaced, which contingency is being normally provided for in the charges made for services being rendered.

It is immaterial to the consumer whether the apparatus is new, in "middle life" or "aged," provided the quality of the service is maintained. There is no reason why the consumer

should expect a lower rate in the fifth year of the life of a plant, simply because some of its items at that time will require renewal five years earlier in the future, than at the date of beginning operation. The charge against the consumer, included in the rate, on account of depreciation, must be maintained throughout the entire life of the plant, in order to provide earnings sufficient to permit its renewal. If the depreciated present value of the property were taken as a basis of fixing rates, when the worn out parts are renewed, the investment must thereby of necessity be increased, and as renewals cannot properly be charged to capital account, the owner being compelled to maintain his property, will not be earning a fair return on the amount of difference between the depreciated value allowed, and the cost new of the renewal. Even if the excess cost of the renewal items, above the depreciated value originally allowed, should be charged to capital account, as a practical matter it would be almost impossible to increase rates to meet the requirements of the increased fair return.

Investments in public utilities are made, not with the expectation that capital is to be paid back to the investor in relatively small amounts annually, or that it is invested for a relatively few years. Capital invested in utilities must necessarily be tied up for a long period of time. As a matter of fact, it is not possible for utility owners to sell their properties frequently, or easily, except at a great sacrifice of investment. In ordinary commercial enterprises, the investment in plant is small relative to the value of the annual sales, with the result that the capital invested is turned over from one to five times a year, in case the owner so desires; with the public utility, however, the case is quite different, when once started the utility must be continued, or the loss of practically the whole or greater part of the investment will result, even though the venture may prove a steadily losing one.

The investor in a public utility must do often without his interest at the start and even provide additional amounts of capital for additions and extensions in order to protect the original investment with the hope of ultimately putting the whole on a paying basis.

**Calculations.**—As the calculation of “present value” on a sinking fund basis is a somewhat complicated process, the table on the following page is presented as a matter of convenience.

# DEPRECIATION

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TABLE XII.—DEPRECIATION TABLE CALCULATED ON A 4 PER CENT. SINK-  
ING FUND BASIS

Assumed Life																
5	6	8	10	12	14	15	16	18	20	25	30	40	50	75	100	Age
82	85	89	92	93	95	95	95	96	97	98	98	99	99	.....	.....	1
62	69	78	83	86	89	90	91	92	93	95	96	98	99	.....	.....	2
42	53	66	74	79	83	84	86	88	90	93	94	97	98	.....	.....	3
22	36	54	65	72	77	79	81	83	86	90	92	96	97	.....	.....	4
	18	41	55	64	70	73	75	79	82	87	90	94	96	99.0	.....	5
		28	45	56	64	67	70	74	78	84	88	93	96	98.7	.....	6
		14	34	47	57	61	64	69	73	81	86	92	95	98.3	.....	7
			23	39	50	54	58	64	69	78	84	90	94	98.1	.....	8
			12	30	42	47	52	59	64	75	81	89	93	97.9	.....	9
				20	34	40	45	53	60	71	79	87	92	97.5	99.6	10
				10	26	33	38	47	55	68	76	86	91	97.1	99.5	11
					18	25	31	41	50	64	73	84	90	96.8	99.4	12
					9	17	24	35	44	60	70	83	89	96.3	99.2	13
						9	16	29	39	56	67	81	88	96.0	99.1	14
							8	22	33	52	64	79	87	95.7	99.0	15
								15	27	48	61	77	86	95.2	98.9	16
								8	20	43	58	75	84	94.8	98.8	17
									14	38	54	73	83	94.2	98.6	18
									7	34	51	71	82	93.9	98.4	19
										28	47	69	80	93.4	98.1	20
										23	43	66	79	92.9	98.0	21
										18	39	64	78	92.2	97.9	22
										12	35	61	76	91.8	97.8	23
										6	30	59	74	91.0	97.5	24
											26	56	73	90.4	97.2	25
											21	53	71	89.9	97.0	26
											16	50	69	89.2	96.8	27
											11	47	67	88.5	96.5	28
											6	44	65	87.9	96.1	29
												41	63	87.0	96.0	30
												38	61	86.2	95.7	31
												34	59	85.6	95.3	32
												30	57	84.9	95.0	33
												26	54	84.0	94.8	34
												22	52	83.1	94.2	35
												18	49	82.4	94.0	36
												14	46	81.5	93.6	37
												10	44	80.5	93.2	38
												5	41	79.6	92.9	39
													38	78.6	92.4	40
													35	77.5	92.0	41
													31	76.5	91.5	42
													28	75.4	91.0	43
													24	74.1	90.5	44
													21	73.0	90.0	45
													17	71.6	89.5	46
													13	70.0	89.0	47
													9	68.8	88.4	48
													4	67.1	87.9	49
														65.8	87.2	50

The "present value," that is, the remaining value of property, computed on a 4 per cent. sinking fund basis, may be obtained at any age given in the column to the extreme right of the table, by multiplying the cost new of the property by the appropriate percentage given in the life column for the life assumed. If the property is assumed to have any scrap or salvage value at the expiration of its life, the amount of same must be first deducted from the cost new before applying the percentage from the table, as above, and then that same amount must be added to the product obtained, in order to secure the present value including scrap or salvage.

In making estimates of the amount of depreciation existing in a given utility property considered as a whole, the nature of each of the elements subject to deterioration that make up that property must be separately considered. Some of these elements are worn out in a few years, others in 10, 20 or even 100 or 200 years, depending on the material of which the element is constructed, the care it has received, method of operation and effect of climate and other local conditions. The first step in determining the depreciated condition of the entire property is to group the several elements or classes of property in accordance with their several distinctive life characteristics, then to determine the age of each historically, namely, by an examination of records and dates of installation; next to adopt estimates of the assumed life properly attributable to the several elements, and on the basis of these assumptions the depreciated condition of each group is computed; the values thus arrived at are modified by estimates of the actual physical condition of the property as determined from inspection of competent engineers. As the final step, the depreciated condition of the property as a whole, that is, the "composite" remaining life value, is determined by either one of two methods:

- (a) The Dollar Year.
- (b) The Direct Method.

In order to determine "composite life" by either method, the property is all classified as to cost new, as well as scrap value, from which is determined the amount in dollars, of each class of property subject to depreciation. In accordance with the dollar year method and the estimated lives allotted to each class of property:

"There is then determined the total number of dollars required for each class during the longest life period, and this in turn is multiplied by the number of years during which each dollar does duty. The result of this multiplication is a figure representing dollar years, which is divided between the total dollars used for the purpose of replacement during the longest life period, which gives the average or composite life."<sup>1</sup>

In order to determine the composite life of the plant by the direct method, the dollars value subject to depreciation, of each class of property, is multiplied by the annual rate of depreciation and the sum of the products divided into the sum of the cost new of all the classes of property. These two methods have been worked out and are shown in detail in the accompanying Tables XIII, XIV and XV.

TABLE XIII.—"DOLLAR YEAR" METHOD

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Times renewed in 75-year period	Dollars required in 75-year period	Dollar years
A.....	5	\$210.	\$0	\$210	15.00	\$3,150	15,750
B.....	8	7,124	14	7,110	9.38	66,692	533,536
C.....	10	17,361	153	17,208	7.50	129,060	1,290,600
D.....	12	26,272	0	26,272	6.25	164,200	1,970,400
E.....	15	143,470	11,920	131,550	5.00	657,750	9,866,250
F.....	16	65,632	33,375	32,258	4.69	151,290	2,420,640
G.....	20	113,336	9,239	104,097	3.75	390,364	7,807,280
H.....	25	43,747	7,631	36,116	3.00	108,348	2,708,700
I.....	50	14,337	0	14,337	1.50	21,506	1,075,300
J.....	60	1,165	0	1,165	1.25	1,456	87,360
K.....	75	21,920	0	21,920	1.00	21,920	1,644,000
Total.....		\$454,574	\$62,331	\$392,243	.....	\$1,715,736	29,419,816
		12 per cent. overhead		47,069			
				\$439,312			

Average life  $\frac{29,419,816}{1,715,736} = 17.15$  years.

"These methods are of the greatest importance in this connection and will therefore be more fully explained. In order to illustrate the results obtained in actual practice under each one of these methods, they have been applied to the depreciable property of the electric lighting and power plant, the composite life of which is shown in Tables XIII and XIV. The electric plant was selected for this purpose because its life is short and the calculations therefore comparatively few. The tables show, among other things, the amounts that must be set aside annually from earnings

<sup>1</sup> City of Ripon vs. Ripon Light & Water Co., 5 W. R. C. R. 20.

## VALUE FOR RATE-MAKING

TABLE XIV.—DIRECT METHOD  
Straight Line

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Annual per cent. of depreciation	Annual amt. required to cover depreciation
A.....	5	\$210	\$0	\$210	20.00	\$42
B.....	8	7,124	14	7,110	12.50	889
C.....	10	17,361	153	17,208	10.00	1,721
D.....	12	26,272	0	26,272	8.33	2,188
E.....	15	143,470	11,920	131,550	6.67	8,774
F.....	16	65,632	33,374	32,258	6.25	2,016
G.....	20	113,336	9,239	104,097	5.00	5,205
H.....	25	43,747	7,631	36,116	4.00	1,445
I.....	50	14,337	0	14,337	2.00	287
J.....	60	1,165	0	1,165	1.67	19
K.....	75	21,920	0	21,920	1.33	292
Total.....		\$454,574	\$62,331	\$392,243	.....	\$22,878
		12 per cent. overhead...		47,069	.....	2,745
				\$439,312		25,623

Average life  $\frac{392,243}{22,878} = 17.15$  years.

TABLE XV.—DIRECT METHOD  
4 Per Cent. Sinking Fund

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Annual per cent. reserved on 4 per cent. basis	Annual fund
A.....	5	\$210	\$0	\$210	18.46	\$39
B.....	8	7,124	14	7,110	10.85	771
C.....	10	17,361	153	17,208	8.33	1,433
D.....	12	26,272	0	26,272	6.65	1,747
E.....	15	143,470	11,920	131,550	4.99	6,564
F.....	16	65,632	33,374	32,258	4.58	1,478
G.....	20	113,336	9,239	104,097	3.36	3,498
H.....	25	43,747	7,631	36,116	2.40	867
I.....	50	14,337	0	14,337	0.65	93
J.....	60	1,165	0	1,165	0.42	5
K.....	75	21,920	0	21,920	0.22	48
Total.....		\$454,574	\$62,331	\$392,243	.....	\$16,543
		12 per cent. overhead...		47,069	.....	1,985
				\$439,312	.....	\$18,528

Average life  $\frac{16,543}{392,243} = 0.04217 = 17.01$  years.



under each of these methods to cover the depreciation charges. They show this for the property in each life group as well as for all the groups or the plant as a whole. It will be noticed that the so-called overhead charges in construction were excluded from the costs upon which the depreciation charges were figured. This was done more as a matter of convenience in the calculations than because some at least of these overhead costs are not proper items to be covered by depreciation allowances. The formula used in the calculation in each case is also given in the respective tables. In order to shed further light on these methods and enable some conclusion to be drawn as to their respective advantages or disadvantages, tables have also been worked out and included herein which show for each method, for the period given, the respective amounts placed in the depreciation reserve to cover depreciation, and withdrawn therefrom to cover the cost of renewing discarded property, together with the cumulative balances on hand in the reserve. In these calculations it has been assumed that each part of the plant is to be renewed at the end of its estimated life, and that the life of the plant is therefore perpetual. It has further been assumed that the amount set aside from year to year remains the same, and that there are no changes in the cost of the property during the period. The computations in the tables cover a period of 75 years, which period corresponds to the life of that group of the property which has the longest life. This period was chosen in order to show the condition of the reserve account up to the time when all the property had been renewed at least once. Before these methods are further explained and illustrated it should be pointed out that the cost new of the depreciable property of the electric plant in question amounts to \$454,574; that the scrap value of the same foots up to \$62,331; and that the balance between this cost and scrap value is \$392,243. This balance represents the total depreciation, or the cost of renewals that must be provided for during the composite life of the plant in order to keep the investment intact. As this composite life of the plant as a whole is about 17.15 years, the average amount per year is about \$22,878. It should also be explained that with an annual requirement for depreciation of \$22,878, the total requirements for 75 years would amount to \$1,715,850. Under the straight line method, the amount that should be set aside annually to cover depreciation is obtained by dividing the balance between the cost new of the property and its scrap value by its estimated life. As in this case this balance, as stated, was \$392,243, and the composite life of the plant 17.15 years, the annual amount to be set aside for depreciation is \$22,878. These facts are illustrated in Table XIV. This table also shows that the annual rate of depreciation varies from 20 per cent. for the property in the 5-year group to 1.33 per cent. for the property in the 75-year group. The average rate for all of these groups is 5.83 per cent. on the depreciable amount. The straight line method is much more simple and direct

than any of the other methods. It is advocated by the interstate commerce commission and for certain purposes also by the Wisconsin and other State commissions. Under the sinking fund method it is assumed that the amounts set aside for depreciation are invested or used at compound interest, and that the interest so obtained also goes into the depreciation reserve. Since in this case the interest on the sum thus set aside, as well as these sums themselves, becomes a part of the fund, it necessarily follows that the latter need not be as large as would be the case if no interest was allowed thereon. On a 4 per cent. sinking fund basis, the amount so set aside and charged to expenses is \$16,543, or about 4.20 per cent. on the property. When the interest on balances from this time on also is included, it is found that the amounts placed in the fund gradually increase. At 4 per cent. compound interest, the annual allowances increase from \$16,543 for the first year, to \$23,545 for the tenth and \$30,985 for the seventeenth year. When both the principal and the interest allowances are thus considered, the total amounts thus set aside for depreciation will be found to be considerably higher than when the former alone is considered. It is seen from these figures that under this method the estimated depreciation, or the provisions therefor, are lowest at first and are then gradually increasing from year to year. This is also, as a rule, the course that is followed by the earnings of public utilities. It is further held that it is in accord with the course of actual depreciation from the point of view of the service value of the property. As a part of the provisions for depreciation is made up of interest allowances on the balances in the depreciation fund, it also follows that, under this method, the direct charges to operating expenses for this purpose are correspondingly lower. These facts tend to place this method in rather favorable light. It is also used by the Wisconsin commission, when it seems to be the method that is best suited to the conditions."<sup>1</sup>

From these tables it will be seen that, while the rate of depreciation per year, on a straight line basis, varies from 20 per cent. for the property having the shortest life to 1.33 per cent. for the property having the longest life, the average rate of depreciation is 5.83 per cent. on the composite life of 17.15 years. In a similar way the annual rate of depreciation on a 4 per cent. sinking fund basis will be found to be about 4.20 per cent. for the composite life.

Attention may be called to the difference in the average or composite life derived by the sinking fund method, which is 17.05 years as compared with 17.15 years, derived by the dollar

<sup>1</sup> Paper, "Depreciation," by Hon. Halford Erickson, Convention of Central Water-works Association, Detroit, Mich., Sept. 25, 1912.

year and direct methods. It might seem at first glance as if the difference was due to some error in computation. Such is not the case, however, as will be seen from the following explanation. In the dollar year and direct methods the average life is the number of years that will elapse before the property will have depreciated an amount equal to the first cost less scrap value, that is, a number of years must elapse in order that the accumulation of payments made to cover depreciation will amount to the first cost. In the use of the sinking fund method, the average or composite life is the number of years required to accumulate an amount equal to the first cost of the plant, less scrap value, at a certain annuity, provided no withdrawals from the accumulated fund are anticipated. The method used is based upon the withdrawals from time to time from the fund accumulated by the payments of the annuity, with its interest accruals, as becomes necessary to renew the worn-out parts. To meet these demands made from time to time upon the fund, in accordance with the assumptions, there must always be available in the fund amounts sufficient to meet the depreciation requirements. This difference in principle and method has been clearly explained by Dr. Alexander C. Humphreys as follows:

“By the direct scheme (no interest) the accumulation of annual payments in the fund must necessarily be equal at the end of any year to the accrued depreciation. By the compound interest scheme this necessarily would never be the case unless a time was reached when all the parts of plant expired at the same time. There is always an overlapping of the life periods of the several parts of plant, and so there will never be in the fund sufficient to meet the total depreciation, though there will always be enough to meet the requirements as to each part of the plant as it has to be renewed. This means that when this overlapping of life periods occurs, as it probably always would in practice, the compound interest sinking fund scheme, strictly speaking, is only applicable to the case of a plant operating in perpetuity. It is thus seen that the compound interest sinking fund scheme, and the simpler scheme, which eliminates interest accumulations, are essentially different in operation. In connection with the sinking fund scheme the term ‘average life’ is misleading, whereas, by the direct scheme the true average life, if desired, can be determined by the method shown in this supplementary note.

“To further illustrate that the true average life will not be the same as the time during which a sinking fund scheme, if undisturbed, will accumulate the total value of plant, we may apply a 2 per cent. and a 6 per cent. sinking fund scheme to the life table already used. To make the

comparison more apparent, I will include in the one table these two schemes, the original 4 per cent. scheme and the direct scheme which entirely eliminates interest:

TABLE XVI

Parts of plant	Estimated life in years	Value of plant in dollars		Amount to be set aside each year to cover depreciation			
				6 per cent. sinking fund	4 per cent. sinking fund	2 per cent. sinking fund	0 per cent. no interest
A	10	25,000		1,896.75	2,082.25	2,283.25	2,500.00
B	15	50,000		2,148.00	2,497.00	2,891.50	3,333.33
C	25	100,000		1,823.00	2,401.00	3,122.00	4,000.00
D	35	150,000		1,345.50	2,037.00	3,000.00	4,285.71
E	50	175,000		602.00	1,146.25	2,068.50	3,500.00
Total value of plant ... 500,000			Total annual payments	7,815.25	10,163.50	13,365.25	17,619.04
Annual payments in per cent. of plant value.....				1.563	2.03	2.673	3.524
Years required to redeem total value of plant.....				27.05	27.73	28.2	28.378

"It is thus seen that as the interest rate of the sinking fund increases not only will the annual depreciation payment be reduced in amount, but, if we stipulate that in the meantime no withdrawals shall be made as in fact called for by the life table, then the time required to accumulate the total value of plant will also be reduced.

"This seeming contradiction is the result of this stipulation, necessarily introduced for this time comparison. For we must remember that the amounts actually withdrawn to meet partial depreciations ('A,' 'B,' 'C,' 'D,' and 'E'), in accord with the life table, will be the same, no matter what the sinking fund rate of interest; and as we assume that these amounts are to be left in the fund and allowed to accumulate, the higher the rate of sinking fund interest the greater will be the tendency of these accumulations to reduce the time in which the total value of plant will be produced.

"The higher the sinking fund rate of interest, the smaller will be the sinking fund liability for each part between the several withdrawal dates, therefore, the slower the accumulation and a consequent tendency between withdrawal dates to lengthen the so-called average life. While this tendency ceases for each part at its withdrawal date, the tendency is always in force with some of the parts, and therefore always affects the scheme as a whole."<sup>1</sup>

<sup>1</sup> Supplement No. 1 to Lecture Notes by Dr. Alex. C. Humphreys.

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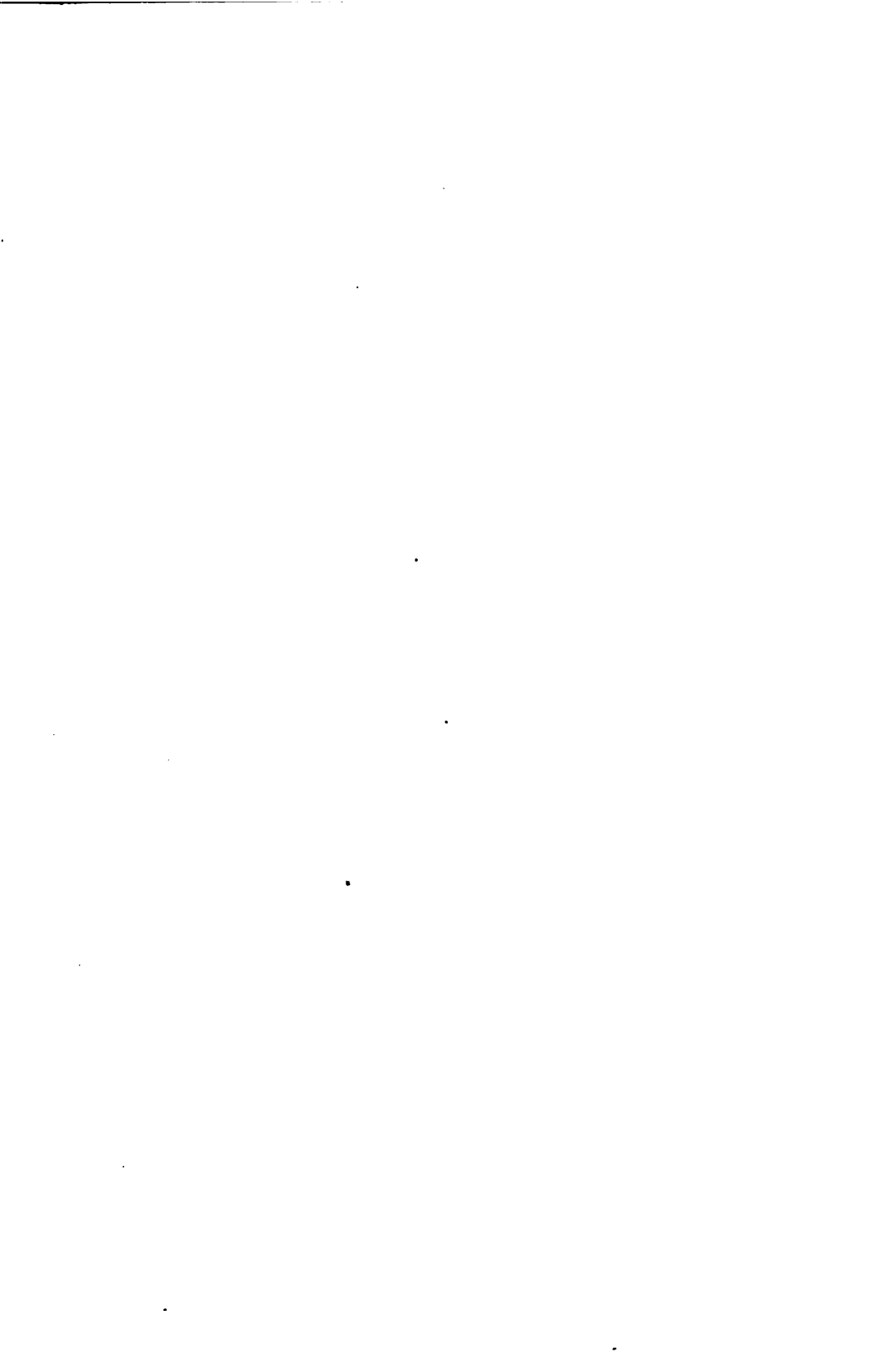
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